การเปลี่ยนโหมดสีของแถบสี

นางสาว ยุวดี เที่ยงทางธรรม

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาเทคโนโลยีทางภาพ ภาควิชาวิทยาศาสตร์ทางภาพถ่ายและเทคโนโลยีทางการพิมพ์
คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2543
ISBN 974-13-0052-2

COLOR MODE CHANGE OF COLOR CHARTS

Miss Yuwadee Thiangthangtum

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Imaging Technology
Department of Imaging Science and Printing Technology
Faculty of Science
Chulalongkorn University
Academic Year 2000

ISBN 974-13-0052-2

Thesis Title	COLOR MODE CHANGE OF COLOR CHARTS
By	Miss Yuwadee Thiangthangtum
Field of study	Imaging Technology
Thesis Advisor	Assoc. Prof. Pontawee Pungrassamee
Thesis Co-advisor	Prof. Dr. Mitsuo Ikeda

Accepted by the Faculty of Science, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master (Doctor) 's Degree

…….. Dean of Faculty of Science
(Associate Professor Wanchai Phothiphichitr, Ph.D.)

THESIS COMMITTEE

……..... Chairman
(Professor Suda Kiatkamjornwong, Ph.D.)

……..…...…. Thesis Advisor
(Associate Professor Pontawee Pungrassamee, M.S.)

…….. Thesis Co-advisor
(Professor Mitsuo Ikeda, Ph.D.)

…….. Member
(Professor Taworn Wacharapai, Ph.D.)

…….. Member
(Associate Professor Aran Hunsuebsai, Ph.D.)

ยุวดี เที่ยงทางธรรม : การเปลี่ยนโหมดสีของแถบสี (COLOR MODE CHANGE OF COLOR CHARTS) อ. ที่ปรึกษา : รศ. พรทวี พึ่งรัศมี , อ. ที่ปรึกษาร่วม : ศ.ดร. มิสุโอะ อิเคดะ , [265 หน้า]
ISBN 974-13-0052-2

เมื่อความสว่างของแหล่งกำเนิดแสงแบบจุดที่ฉายลงไปบนพื้นผิวของวัตถุเพิ่มขึ้นที่ละน้อยๆ พบว่าเกิดการเปลี่ยนแปลงของสีของวัตถุแต่ลักษณะที่ปรากฏยังเป็นธรรมชาติกลมกลืนกับสภาพแวดล้อมซึ่งยังคงอยู่ในโหมดสีของวัตถุเมื่อความสว่างเพิ่มมากขึ้นๆพื้นผิวของวัตถุเริ่มเปลี่ยนแปลงไม่เป็นธรรมชาติเมื่อดูเปรียบเทียบกับวัตถุที่ว่างอยู่ในสภาพแวดล้อมนั้นจากปรากฏการณ์นี้สามารถอธิบายได้ว่าเมื่อความสว่างของพื้นผิวของวัตถุสูงขึ้นๆจนพื้นผิวของวัตถุปรากฏพ้นไปจากขอบเขตของปริภูมิการรับรู้ของการมองเห็นของความส่องสว่าง(The recognize visual space of illmination:RVSI) ที่ปรากฏให้เห็นไปถึงความสว่างของโหมดสีของแสง งานวิจัยนี้กำหนดค่าขอบเขตความสว่างของแถบสี 39 สี ในระบบสีมาตรฐานของ Munsell ในความสว่างที่ต่างกันสองระดับ คือ 5 ลักซ์ และ 50 ลักซ์ พบว่าค่าขอบเขตความสว่างของแถบสีเหลืองมีขอบเขต RVSI สูงในขณะที่สีแดงมีขอบเขต RVSI ต่ำและแสดงสมการการคำนวณค่าขอบเขตความสว่างของแถบสีจากความส่องสว่างของห้อง งานวิจัยนี้ได้ศึกษาถึงความสว่างของแถบสี ซึ่งเป็นตัวกำหนดขอบเขตความสว่างโดยวิธีการปรับเทียบความสว่างกับแถบสีเทาอ้างอิง N7 พบว่าส่วนใหญ่ค่าขอบเขตความสว่างของแถบสีถูกกำหนดโดยความสว่างในพื้นที่ที่วัตถุนั้นวางอยู่ แต่มีปัจจัยที่สองก็คือการปรากฏลักษณะที่ไม่เป็นธรรมชาติของแถบสีนอกจากความสว่าง เช่น ความจ้า ความโปร่งใส หรือการเรืองแสง ลักษณะที่เห็นเหล่านี้เป็นสาเหตุทำให้ค่าของขอบเขตความสว่างลดลง ข้อมูลค่าสเปกตรัมของแถบสีที่ขอบเขตความสว่าง และวัตถุที่อยู่ในห้องผู้สังเกตการณ์ได้แสดงในรายงานด้วย

ภาควิชา วิทยาศาสตร์ทางภาพถ่ายและเทคโนโลยีทางการพิมพ์
สาขาวิชา เทคโนโลยีทางภาพ
ปีการศึกษา 2543

ลายมือชื่อนิสิต .....
ลายมือชื่ออาจารย์ที่ปรึกษา .....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม .....

4272372623 : MAJOR IMAGING TECHNOLOGY
KEY WORD: COLOR APPEARANCE MODE / OBJECT COLOR / LIGHT SOURCE COLOR / RECOGNIZED VISUAL SPACE OF ILLUMINATION / BRIGHTNESS MATCHING
YUWADEE THIANGTHANGTUM : COLOR MODE CHANGE OF COLOR CHARTS.
THESIS ADVISOR : ASSOC.PROF.PONTAWEE PUNGRASSAMEE,
THESIS CO-ADVISOR : PROF. MITSUO IKEDA, Ph.D., 265 pp.
ISBN 974-13-0052-2.

It is known qualitatively that when the luminance of a particular surface of an object is gradually increased by spot lighting, the color changes but the appearance remains natural keeping still the object color mode. For a further increase of the luminance, the surface begins to appear unnatural as an object placed in the room. This situation was expressed as that the luminance of the surface became too high so that the surface appearance went beyond the border of the recognized visual space of illumination, RVSI to present the light source color appearance. This paper quantitatively determined the border luminance for 39 color charts for two different illuminance of the room, 5 and 50 lx. The border luminance was found high for yellow color charts while it was low for red color charts. An equation to calculate the border luminance from the room illuminance was proposed. To find whether the brightness of the color charts determines the border, the brightness matching was conducted for all the color charts against an achromatic reference chart of N7. It was found that the border luminance was mainly determined by the brightness but there was the secondary factor. It was unnatural appearance of the test charts other than the brightness such as dazzling, transparent or fluorescent. These appearances caused the border luminance to reduce. The spectral distribution measurements of the test charts at their borders and of the objects in the observer's room are also reported. (1)

Department of Imaging and printing technology
Field of study Imaging Technology
Academic Year 2000

Student's Signature ……
Advisor's Signature .....….
Co - advisor's Signature .....…

ACKNOWLEDGMENTS

First of all, I wish to express my sincere appreciation to my advisor and my co-advisor, Assoc. Prof. Pontawee Pungrassamee, Assoc. Prof. Dr. Aran Hunsuebsai and Prof. Dr. Mitsuo Ikeda, for their valuable suggestion and help throughout the course of the work; special thank you to Prof. Dr. Mitsuo Ikeda for his kind instruction, guidance and care when I carried out the experiment at Ritsumeikan University (Rits), Japan.

I acknowledge Ms. Yoko Mizokami and Rumi Yamauchi at Ritsumeikan University for their help in preparing the apparatus and their participation in the experiment. This experiment was conducted at Chulalongkorn University supported in part by Thailand-Japan Technology Transfer Project.

Thankful to everybody in department of Photonics, faculty of Science and Engineering, Ritsumeikan University for their help and care while I stayed in Japan.

Finally, I wish to thank the thesis committee for their comments. Thanks also go to everyone who has charitably participated suggestions and given me moral supports.

Yuwadee Thiangthangtum

CONTENTS

	PAGE
ABSTRACT (IN THAI)…….….	iv
ABSTRACT (IN ENGLISH)…….…..	v
ACKNOWLEDGMENT……..	vi
CONTENTS……..…	vii
LISH OF TABLES……..	xi
LISH OF FIGURES…….	xii
CHAPTER 1 : INTRODUCTION……...	1
1.1 Objectives……	3
1.2 Scope of the Research…….	3
1.3 Content of the Thesis……..	4
CHAPTER 2 : THEORETICAL CONSIDERATION AND LITERATURE REVIEW……	5
2.1 Theoretical Consideration…….……	5
2.1.1 The Munsell ' System…….	6
2.1.1.1 Munsell Hue…….	7
2.1.1.2 Munsell Value…….…….	8
2.1.1.3 Munsell Chroma……	10
2.1.2 The CIE System…….	10
2.1.2.1 CIE Standard Sources and Illuminants….	11

CONTENTS(continued)

PAGE

2.1.2.2 CIE Standard Observers……. 15

2.1.2.3 The CIE Diagram…… 16

2.1.2.4 Comparison with Psychological Attributes 22

2.1.3 Color Mode……. 26

2.1.4 Explanation of Color Mode by the RVSI…… 28

2.1.4.1 Lightness Constancy…….. 28

2.1.4.2 Color Constancy……. 29

2.1.4.3 The concept of RVSI…….. 31

2.1.4.4 The relationship between the size of the RVSI and the object color and the light source color 32

2.2 Literature Review…….. 33

CHAPTER 3 : EXPERIMENT……. 36

3.1Apparatus……. 36

3.2 Subject's Tasks…… 38

3.3 Test Charts and Experiment Condition…… 39

3.4 Procedure……. 41

3.4.1 Calibration…… 41

3.4.2 Experiment…… 43

3.4.3 Brightness matching……. 44

CONTENTS(continued)

PAGE

3.4.4 Calculation from the wedge scale to log L…… 45

3.4.5 To measuring the spectral distribution…….. 46

CHAPTER 4 : RESULTS AND DISCUSSION…….. 47

4.1 The Border of RVSI……. 48

4.2 The Aperture Appearance……..… 69

4.3 The Brightness Matching……. 69

4.4 Comparison Between the Border and The Brightness……. 87

CHAPTER 5 : CONCLUSION…… 103

REFERENCES……. 105

APPENDICES…….. 109

APPENDIX A : Purkinje Effects……. 110

APPENDIX B : The luminance of the charts…….. 111

APPENDIX C : The luminance at chart N9…… 113

APPENDIX D : The color subjects of different color in
the observer's room……. 114

APPENDIX E : The border experimental and
the brightness matching experiment
data of four subjects……. 116

CONTENTS(continued)

PAGE

APPENDIX F : The spectral distribution data and graph of
the color chart and the spectral distribution data
of the subject in the observer's room…… 133

APPENDIX G : The Helmholtz-Kohlrausch Effect……. 261

VITA……. 264

LIST OF TABLES

TABLE		PAGE
3-1	Nominal Munsell HVC of 39 test charts……..	39
4-1	The mean data of the border of RVSI from all the four subjects…….	58
4-2	Standard deviation of ten determinations for border in luminance cd/m^2……	59
4-3	The values Kc obtained based on the mean result given from the mean data of the border of RVSI for 50lux…….	68
4-4	Standard deviation of ten determinations for brightness matching in luminance cd/m2…….	80
4-5	Correlation factors between the border and the brightness matching luminance……..	99

LIST OF FIGTURES

FIGTURE		PAGE
1-1	Scheme to show the color mode change by the concept of the RVSI…..…	2
2-1	The triangle of color. : light sources, objects, and the human visual system…….	6
2-2	Three-dimensional array of hue, value and chroma……..…	8
2-3	Arrangement of Hue circle in the Munsell system……...	9
2-4	Arrangement of Value of constant Hue in the Munsell system……	9
2-5	The relative stimulus of the brain or instrument interprets as a color……..	11
2-6	Relative spectral radiant power distributions of CIE illuminants A, B, C and D65……	13
2-7	Relative spectral power distributions of CIE illuminants D50 and D65…..	14
2-8	Relative spectral power distributions of CIE illuminants F2, F8 and F11..	14
2-9	Comparison of color matching functions of the 1931 CIE Standard Observers and the 1964 CIE Supplementary Observers……..	16
2-10	The C.I.E. chromaticity diagram for the X, Y, Z set of primaries……...	19
2-11	The C.I.E. chromaticity diagram for the X, Y, Z set of primaries and for incident radiant power from the CIE standard illuminant A……	20
2-12	Chromaticity loci of optimal color stimuli as a function of Y and for incident radiant power from the CIE standard illuminant D_{65}…….	21
2-13	Oblique projection of the (x, y, Y) object-color solid showing the boundary surface representing the optimal color stimuli……	22

LIST OF FIGTURES (continued)

FIGTURE		PAGE
2-14	Inaccuracy for color matches at various chromaticities……	23
2-15	Radiating from the achromatic point are curves denoting colors judged to have constant Munsell Hue at Value 5…….	24
2-16	A scheme showing the determination of apparent lightness……	32
3-1	Scheme of the apparatus……	37
3-2	Chromaticity coordinates of the test charts when illuminated by the projector……	40
3-3	Show the wedge scale of 0-100 for the neutral density wedge filter……	41
3-4	Show the neutral density wedge filter……...	41
3-5	Relationship between the wedge reading and the luminance on the chart of N9……..	42
3-6	A reference white chart of N7 was pasted on the right-hand of the aperture for the test color chart……..	45
3-7	The relationship between luminance in log unit and wedge reading……...	45
4-1a	Result of the border of RVSI in 5lux observer's room by subject MI…….	48
4-1b	Result of the border of RVSI in 50lux observer's room by subject MI……	49
4-2a	Result of the border of RVSI in 5lux observer's room by subject RY…….	50
4-2b	Result of the border of RVSI in 50lux observer's room by subject RY…...	51
4-3a	Result of the border of RVSI in 5lux observer's room by subject YT…….	52

LIST OF FIGTURES (continued)

FIGTURE		PAGE
4-3b	Result of the border of RVSI in 50lux observer's room by subject YT……	53
4-4a	Result of the border of RVSI in 5lux observer's room by subject WR……	54
4-4b	Result of the border of RVSI in 50lux observer's room by subject WR…..	55
4-5a	Result of mean of border of RVSI in 5lux observer's room ……	56
4-5b	Result of mean of border of RVSI in 50lux observer's room ……..	57
4-6a	Comparison the border of RVSI in the 5 lux observer's room for all subjects……..	61
4-6b	Comparison the border of RVSI in the 50 lux observer's room for all subjects……..	62
4-7a	The result of the border of RVSI for each curve was shifted vertically by the average of each subject coincided with total the average for 5 lux…	63
4-7b	The result of the border of RVSI for each curve was shifted vertically by the average of each subject coincided with total the average for 50 lux.	64
4-8a	The average results of the border of RVSI and their the standard deviation of the variation calculated from the data four subjects for 5lux……	65
4-8b	The average results of the border of RVSI and their the standard deviation of the variation calculated from the data four subjects for 50 lux…….	66
4-9	The standard deviation of the test chart ranges mentioned above the chromaticity diagram……..	67

LIST OF FIGTURES (continued)

FIGTURE **PAGE**

4-10a Result of the brightness matching experiment(BM) from the subject MI for 5lux……. 70

4-10b Result of the brightness matching experiment(BM) from the subject MI for 5lux…… 71

4-11a Result of the brightness matching experiment(BM) from the subject MI for 50lux…….. 72

4-11b Result of the brightness matching experiment(BM) from the subject RY for 5lux…… 73

4-12a Result of the brightness matching experiment(BM) from the subject RY for 50lux……. 74

4-12b Result of the brightness matching experiment(BM) from the subject YT for 5lux…… 75

4-13a Result of the brightness matching experiment(BM) from the subject YT for 50lux……. 76

4-13b Result of the brightness matching experiment(BM) from the subject WR for 5lux…….. 77

4-14a Result of the brightness matching experiment(BM) from the subject WR for 5lux…….. 78

LIST OF FIGTURES(continued)

FIGTURE		PAGE
4-14b	Result of the brightness matching experiment(BM) from the subject WR for 5lux……..	79
4-15a	The individual difference the results of the brightness matching data from the four subjects are plotted together for 5lux……..	81
4-15b	The individual difference the results of the brightness matching data from the four subjects are plotted together for 50lux……	82
4-16a	The result of the brightness matching data for each curve was shifted vertically by the average of each subject coincided with total the average for 5 lux……..	83
4-16b	The result of the brightness matching data for each curve was shifted vertically by the average of each subject coincided with total the average for 50 lux……	84
4-17a	The mean of the brightness matching data of all subjects with the standard deviation for 5lux ……..……	85
4-17b	The mean of the brightness matching data of all subjects with the standard deviation for 50lux……	86

LIST OF FIGTURES (continued)

FIGTURE		PAGE
4-18a	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject MI, by plotting their results in a same graph for 5lux……	89
4-18b	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject MI, by plotting their results in a same graph for 50lux……..	90
4-19a	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject RY, by plotting their results in a same graph for 5lux……	91
4-19b	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject RY, by plotting their results in a same graph for 50lux……..	92

LIST OF FIGTURES (continued)

FIGTURE		PAGE
4-20a	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject YT, by plotting their results in a same graph for 5lux……	93
4-20b	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject YT, by plotting their results in a same graph for 50lux……..	94
4-21a	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject WR, by plotting their results in a same graph for 5 lux. …….	95
4-21b	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject WR, by plotting their results in a same graph for 50 lux. ……..	96
4-22a	The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance by plotting their mean results in a same graph for 5lux…….	97

LIST OF FIGTURES(continued)

FIGTURE **PAGE**

4-22b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance by plotting their mean results in a same graph for 5lux……..…. 98

4-23 The slight difference positive for the test charts…….. 100

4-24 The low luminance for red color charts by referring to the subject color region of Munsell Value 7…… 101

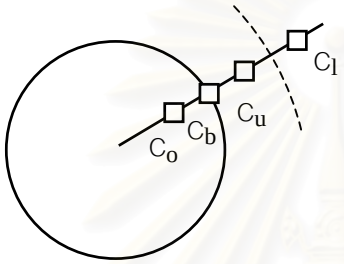
CHAPTER 1

INTRODUCTION

From the purely physical point of view, the production of color requires three things: a source of light, an object illuminated by the light source, and the eye and brain to perceive the color.(2)This research concentrates on the relationship between the light source and eyes and brain to perceive the color. When a color chart is locally illuminated among other objects in a room the color appearance changes according to the illuminance(3). When the illuminance is low the appearance changes to increase saturation and lightness, and it remains as the object color. The appearance finally reaches that of the border, namely the upper limit of appearance to belong to an object in the room. For a further increase the color chart begins to appear too bright or unnatural to be an object belonging to the environment. For a further increase of the illuminance the surface begins to shine of which color depends on the color of the chart. This phenomenon can be expressed in the realm of the concept of the recognized visual space of illumination, RVSI(4). The RVSI is a state of his/her brain of understanding how a space is illuminated, brightly or dimly, and whitely or a little bit reddish when an observer stays in the space. It can be expressed by a sphere of which radius represents the brightness size of the RVSI (Diagram is shown in Fig.1)

If the local illuminance on the color chart is low as indicated by C_o the luminance of the color chart is inside the sphere or a circle for simplicity and the surface exhibits the object color mode. The appearance reaches the border as shown by C_b and then shifts further outside to the position C_u which results with unnatural appearance. The final appearance is the light source color indicated by C_l.

The investigation of the color appearance mode is important because it tells us about the mechanism of the visual system for color perception on one hand and gives us some knowledge about lighting effect in environment on the other. We will determine C_b of Fig. 1, namely the border between the object color appearance and the unnatural color appearance for various color charts.



Note:
C_o: the object color
C_b: the border of RVSI
C_u: unnatural appearance
C_l: the light source color

Fig.1 Scheme to show the color mode change by the concept of the RVSI.

In particular this experiment will investigate whether the border is determined uniquely by the brightness of color chart as shown by some researchers(5). They concluded that the mode of color perception is determined by brightness, and not by luminance. In experience through many experiments on the border in the past, To found very unnatural appear on the surfaces of some colored objects before their brightness reaches the upper limit to be naturally included to the space in question. In still another experiment when a color chip was locally illuminated among other chips in a sheet of the Munsell Book of Color, its appearance became unnatural such that there was no corresponding color chip in the sheet while its appearance did not reach the edge of the sheet of the Book(4). There seem some colors which behave curiously when they are locally illuminated to approach the boundary of the object color. In experiment employed 39 color charts including these colors for the determination of

the border and compared the results with the brightness data of the color charts to see whether there exists a good correlation between the two kinds of data, and if not, to investigate the reason for it.

1.1 Objectives

1. To obtain the border of recognized visual space of illumination (RVSI) by measuring the transition point from object color to light source color.
2. To investigate whether the border is determined by the brightness.
3. To investigate whether the border is the shape of the spectral distribution that reaches the subject's eyes.

1.2 Scope of the thesis

This experiment indicates the border of RVSI of color charts by measuring the transition point from object color to light source color. The size of the RVSI is also investigated by employing different illuminance (at 5lx and 50lx). And as the next step test a factor to determine the border of RVSI by a hypothesis that "the border of RVSI is determined by brightness of test color charts, namely if the brightness of a test color chart reaches a certain level the test chart changes to the light source color in its color appearance". In addition, There are some other factors to determine the border beside the brightness. One factor is the shape of the spectral distribution that reaches the subject's eyes. It may take a shape that would not exist in objects that only reflect light coming from the ceiling light and exists only when the objects are

additionally and secretly illuminated by another light source. The human may be detecting the color appearance given by the non-existing spectral distribution in normal lighting environment.

1.3 Content of the thesis

Chapter 2 deals with the overview of the theoretical considerations and literature reviews. Chapter 3 gives the description on the experimental apparatus, subject's tasks, materials, which are test charts, under study and experiment conditions, and the procedures of experiment. Chapter 4 contains the results and discussion on the border of RVSI of color charts and the factors to determine the border of RVSI. The results obtained from the subjects for 39 stimuli. Each point was an average of ten determinations of log Y. The luminance in logarithmic units (cd/m^2), that matched the stimulus, was plotted along the ordinate. Then the results of the border experiment and the brightness matching from each subject and the correlation factors between the border and the brightness matching luminance are shown. Finally, the results are concluded in Chapter 5 along with suggestions. This research investigates the color appearance mode change of color charts and its mechanism of the visual system for color perception on one hand and gives us some knowledge about lighting effect in environment on the others.

CHAPTER 2

THEORETICAL CONSIDERATION AND LITERATURE REVIEW

2.1 Theoretical Consideration

The color appearance of objects depends on three components, which are shown in the triangle of color in Figure 2-1,The first component is a source of visible electromagnetic energy necessary to initiate the sensory process of vision. The second component is an object, whose chemical properties and physical properties modulate the electromagnetic energy. The third component is the human visual system. The modulated energy is imaged by the eye, detected by photoreceptors, and processed by the neural mechanisms of the human visual system to produce the perception of color. Note that the light source and visual system are also linked in Figure 2-1. This is done to indicate the influence that the light source itself has on color appearance through chromatic adaptation, and so on.

Since all three components of the triangle of color in Figure 2-1 are required to produce color, they must also be quantified in order to produce a reliable system of physical colorimetry. Light sources are quantified through their spectral power distribution and standardized as illuminants. Material objects are specified by the geometric and spectral distribution of the energy they reflect or transmit. The human visual system is quantified through its colormatching properties that represent the first stage response (cone absorption) in the system. Thus colorimetry, as a combination of all of these areas, draws upon techniques and results from the fields of physics, chemistry, psychophysics, physiology, and psychology.

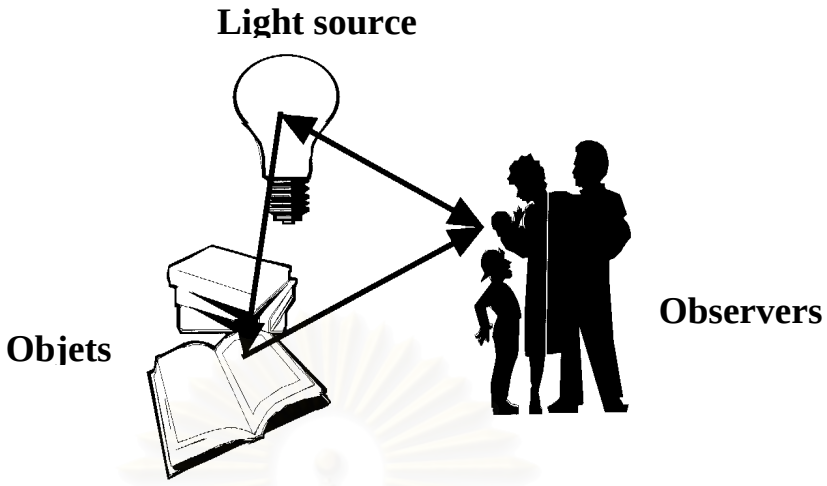


Fig. 2-1 The triangle of color. Color exists due to the interaction of three components: light sources, objects, and the human visual system. (6)

Not only the pathway of human color perception is extremely complicated and not completely understood, but also the mechanism for interpretation in human brain is still not well comprehend. Furthermore, the psychology factors such as experience, knowledge and attitude are uncontrollable. Thus, it is difficult to communicate about color. In order to obtain the effective the color communication, it is necessary to study about color order system. This thesis considers only the Munsell System and the CIE system (7-9).

2.1.1 *The Munsell System*

The Munsell System is one of the most widely used color orders systems. A.H. Munsell, an artist, originated the conceptual structure of the Munsell system in 1905. After that, it was extend and refined in various ways by Nickerson since 1976.

The important feature of the Munsell system is that the color is arrange as nearly as possible and the intervals of the visual perception between two neighboring samples are equal. For this reason. the perceptual difference between any adjacent samples is constant.

The Munsell system is both of the collection of the painted samples, and the system for describing all possible color in terms of its three coordinates, Munsell Hue, Munsell Value and Munsell Chroma. These coordinates correspond to three variables commonly used to describe color, which are hue, value and chroma, respectively. Colors are arranged in three-dimensional cylindrical form as shown in Figure 2-2 (10). The color samples in the Munsell Book usually arrange in plane or pages of constant hue. On each page, the color samples are arranged by Munsell Value along the vertical direction and by Munsell Chroma along the horizontal direction.

2 .1.1.1 Munsell Hue

Hue is that quality of color described by the words red, yellow, green, blue and so on. The spacing of the hue around the grey scale represent the uniform difference of perceived hue between neighboring hue pages. There are five principal hues, Red, Yellow, Green, Blue and Purple, and they are designated 5R, 5Y, 5G, 5B and 5P, respectively. The intermediate hues are designated 5YR, 5GY, 5GB, 5PB and 5RP. Finer divisions between any two major neighboring hues are represented by decimals, as shown in Figure 2-3 (11). There are ten major hues ranging in the hue circle. Each of the ten is divided into 10 hue steps. Thus, the Munsell system contains totally 100 hues.

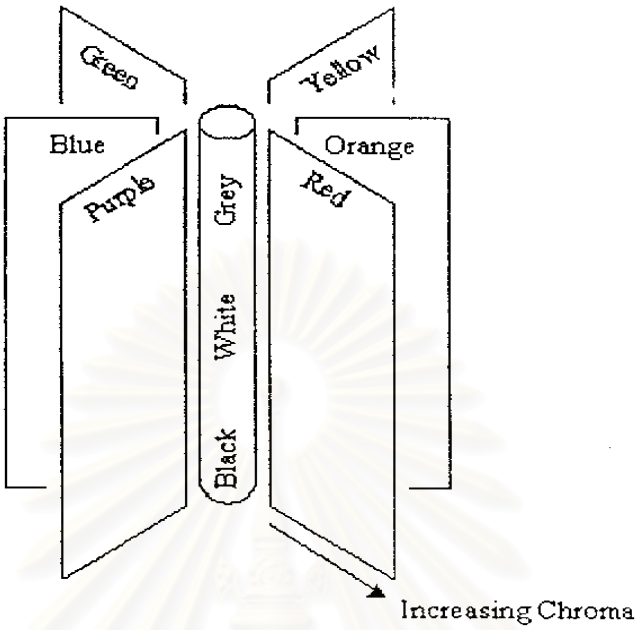


Fig. 2-2 Three-dimensional array of hue, value and chroma.

2.1.1.2 Munsell Value

Munsell Value, representing the lightness scale, is arranged in the vertical direction or the backbone of the Munsell system. Value is that quality by which a color can be classified as equivalent in lightness to some mertiber of the series of gray samples ranging from white to black. It is denoted 10/ when while and 0/ when black. From decimal, there are 9 gray concentrations uniformly locating in between black and white and designating the values, as shown in Figure 2-4 (12). For example, a value of 7.5 is perceptually midway in lightness between sample having value of 7 and 8.

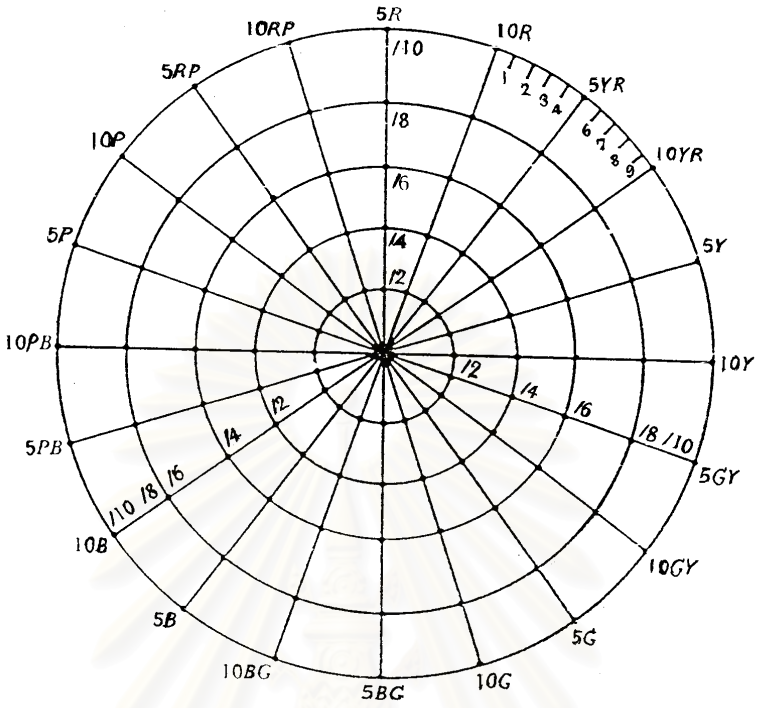


Fig. 2-3 Arrangement of Hue circle in the Munsell system.

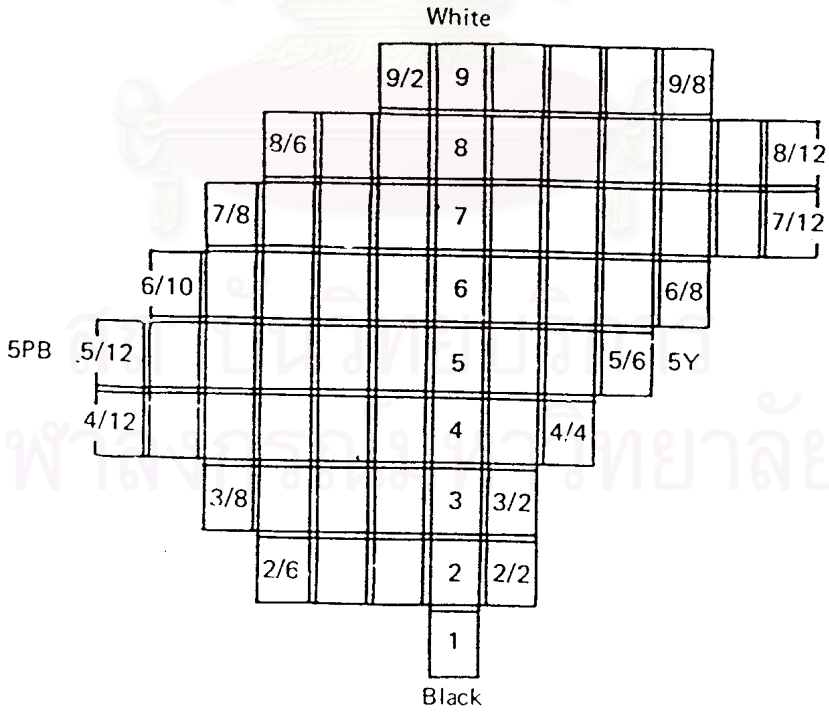


Fig. 2-4 Arrangement of Value of constant Hue in the Munsell system.

2.1.1.3 Munsell Chroma

Chroma is the quality that describes the degree of difference between a color and a gray of the same value or lightness. The distances of the samples from value axis are intended to represent uniform differences in perceived chroma and are given numbers. Typically, number 4 or less represents weak color, and number 10 or more stands for strong color. The scale of chroma increases in step of 2 from /0, /2,/4, so on until it reaches /10, /12,/14 and more.

2.1.2 *The CIE System*

The CIE system is also an important system, which is usually employed in connection with instruments for color measurement. This system has been established by the Commission International de I'Eclairage, the French title of the international committee, or International Commission on Illumination in 1931. The CIE system starts with the premise developed on the human color perception process that the stimulus for color is provided by the proper combination of a source of light, an object, and an observer.

The fundamental aspects of color in the CIE system concern with three factors. One factor is the relative spectral distribution of radiant flux emitted from a light source and incident on an object. The other two factors are the spectral reflectance factors of the object, and the color matching functions of the observer in viewing the object, as shown in Figure 2-5 (13). Unlike the Munsell system, this

system is not directly based on psychological scaling of color, but the color quantification.

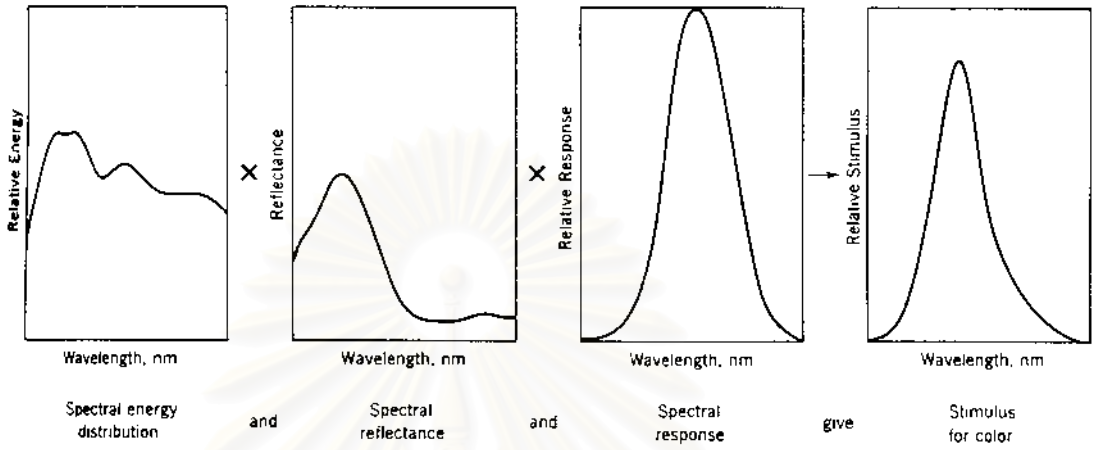


Fig 2-5 The relative stimulus of the brain or instrument interprets as a color.

The CIE, introduce the element of standardization of source an observer, and the methodology to derive numbers that provide a measure of a color seen under a standard source of illumination by standard observer.

2.1.2.1 CIE Standard Sources and Illuminants.

The CIE has established a number of spectral power distributions as CIE illuminants for colorimetry. These include CIE illuminants A, B, C, D65, D50, F2, F8, and F1 l: (14,15)

- CIE illuminant A represents a Plancklan radiator with a color temperature of 2,856 K. It is used for colorimetric calculations when incandescent illumination is of interest. Its distribution, A, is shown in Fig. 2-6(16).

- CIE Standard Illuminant B was intended to simulate direct noon sunlight. It is described by correlated color temperatures of 4874 K. Its distribution, B, is shown in Figure 2-6.

- CIE illuminant C is the spectral power distribution of illuminant A as modified by particular liquid filters defined by the CIE. It represents a daylight simulator with a CCT of 6,774 K. Its distribution, C, is shown in Figure 2-6.

- CIE illuminants D65 and D50 are part of the CIE D~series of illuminants that have been statistically defined based upon a large number of measurements of real daylight. Illuminant D65 represents an average daylight with a CCT of 6,504 K, and D50 represents an average daylight with a CCT of 5,003 K. D65 is commonly used in colorimetric applications, while D50 is often used in graphic arts applications. CIE D illuminants with other correlated color temperatures can be easily obtained. Their distribution, D50 and D65, are shown in Figure 2-7(17).

- CIE F illuminants (12 in all) represent typical spectral power distributions for various types of fluorescent sources. CIE illuminant F2 represents cool-white fluorescent with a CCT of 4,230 K. Illuminant F8 represents a fluorescent D50 simulator with a CCT of 5,000 K, and illuminant F11 represents a triband fluorescent source with a CCT of 4,000 K. Triband fluorescent sources are popular because of their efficiency, efficacy, and pleasing color-rendering properties. Their distribution, F2, F8 and F11, are shown in Figure 2-8(18).

- The equal-energy illuminant (sometimes called illuminant E) is often of mathematical utility. It is defined with a relative spectral power of 100.0 at all wavelengths.

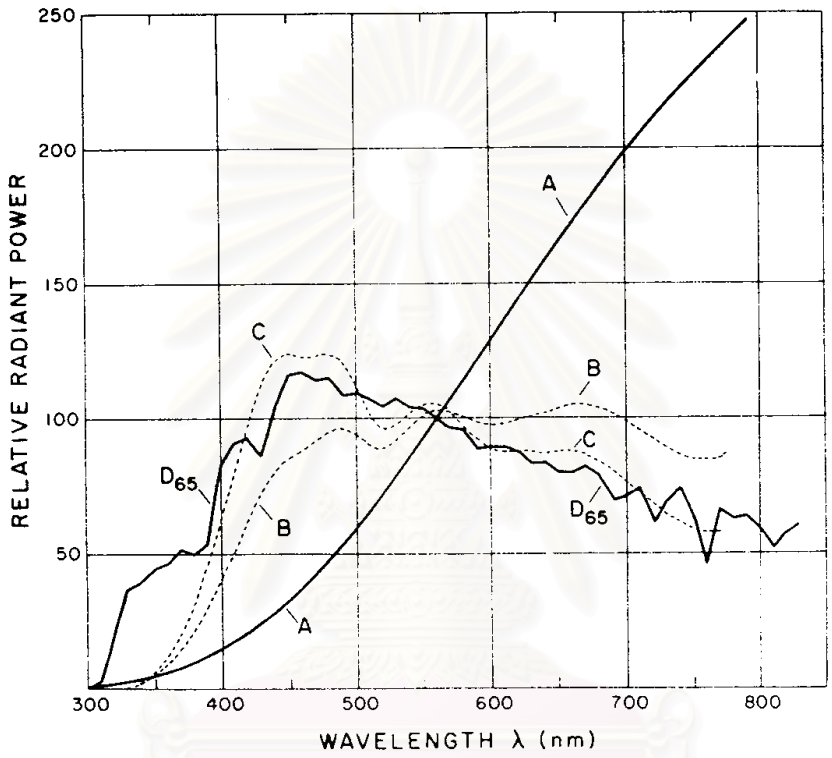


Fig. 2-6 Relative spectral radiant power distributions of CIE illuminants A, B, C and D65.

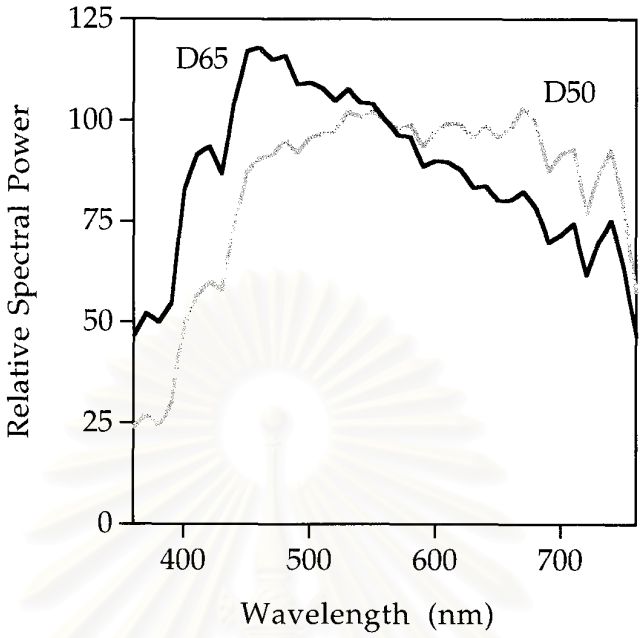


Fig. 2-7 Relative spectral power distributions of CIE illuminants D50 and D65.

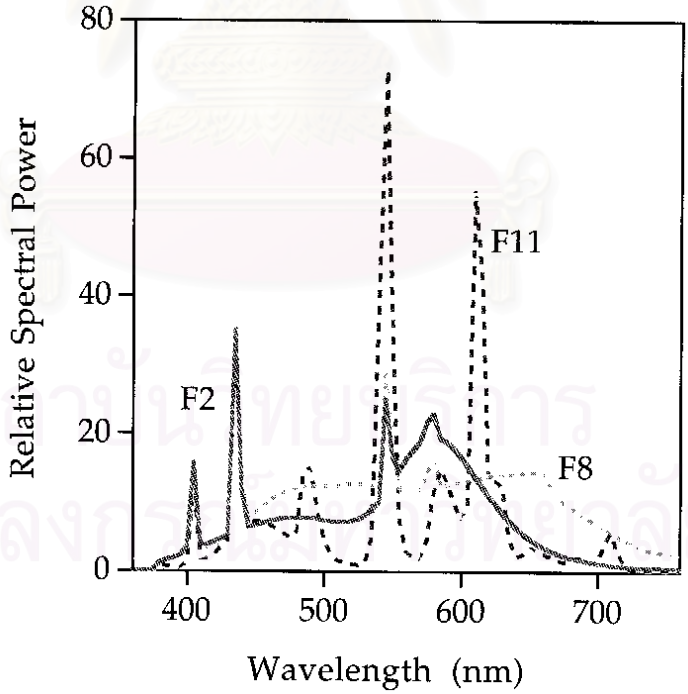


Fig. 2-8 Relative spectral power distributions of CIE illuminants F2, F8 and F11.

2.1.2.2 CIE Standard Observers

CIE standard observers are the representatives of the average human population having normal color vision. They can be classified into two groups, the 1931 CIE Standard Observer s and the 1964 CIE Supplementary Standard Observers.

The CIE recommends the colorimetric specifications of color, are base on the spectral tristimulus values $\bar{x}(\lambda), \bar{y}(\lambda), \bar{z}(\lambda)$ which are also called the CIE color matching functions for the Standard Colorimetric which were derived from measurement with a 2° visual field by Guild and Wright (19). The angle of vision is 2° so the visual takes place only on fovea. The field of view is much narrower than that is normally used for critical color appraisal. However, the variation of the visual field size effects color classification. The CIE recommends another set of color matching functions $\bar{x}_{10}(\lambda), \bar{y}_{10}(\lambda), \bar{z}_{10}(\lambda)$ have field sized greater than 4°. It is the 1964 CIE Supplementary Standard Observers, which is also called 10° observers. This set gives more accurate correlation with visual color matching. The comparison of color matching functions of the 1931CIE Standard Observers and the 1964 CIE Supplementary Observers was shown in Fig. 2-9 (20).

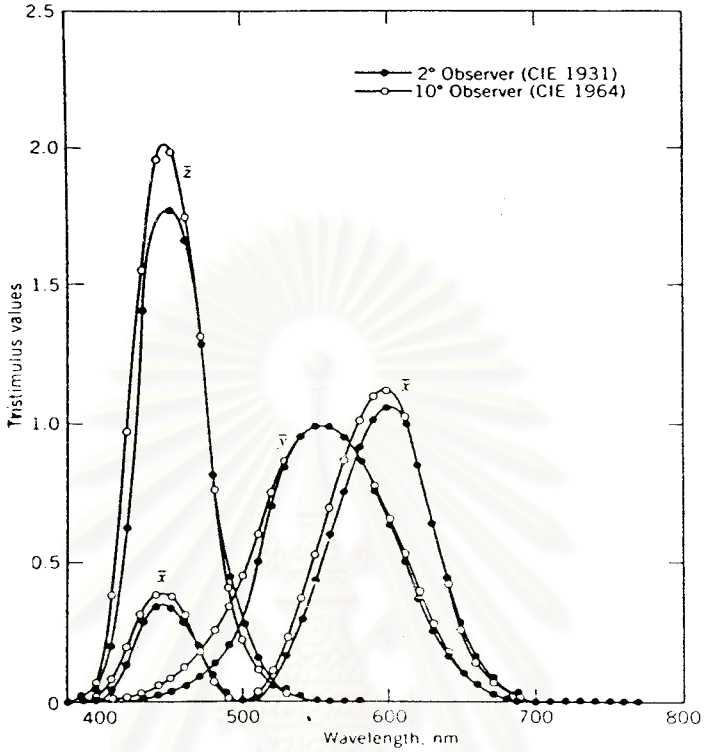


Fig. 2-9 Comparison of color matching functions of the 1931 CIE Standard Observers and the 1964 CIE Supplementary Observers

2.1.2.3 The CIE Diagram

Given the spectral energy distribution of a stimulus in either relative or absolute units, it is necessary only to multiply, wavelength by wavelength, by each of these curves, and summate or integrate separately for each function, to obtain numbers that represent the proper relative amounts of the three primaries to match the color matching function $\bar{x}(\lambda), \bar{y}(\lambda), \bar{z}(\lambda)$ defined in 1931 by CIE; also referred to as 2° XYZ tristimulus values. These three numbers were given the designations X, Y,

and Z. They are suitable for a viewing angle of 4° or less and are defined for reflecting objects by the following formulas(21):

$$X = K \int_{380}^{780} S(\lambda)\bar{x}(\lambda)R(\lambda)d\lambda$$

$$Y = K \int_{380}^{780} S(\lambda)\bar{y}(\lambda)R(\lambda)d\lambda$$

$$Z = K \int_{380}^{780} S(\lambda)\bar{z}(\lambda)R(\lambda)d\lambda$$

$$K = \frac{100}{\int_{380}^{780} S(\lambda)\bar{y}(\lambda)d\lambda}$$

where

S (λ): Relative spectral power distribution of the illuminant.

$\bar{x}$ (λ), $\bar{y}$ (λ), $\bar{z}$ (λ): Color-matching function for CIE 2°

Standard Observer (1931)

R(λ): Spectral reflectance of spectimen

Then the XYZ tristimulus values calculated to xyz according to formulas (22):

$$x = \frac{X}{X+Y+Z}$$

$$y = \frac{Y}{X+Y+Z}$$

$$z = \frac{Z}{X+Y+Z} = 1\text{-}x\text{-}y$$

If the above formulas are used with the X_{10} Y_{10} Z_{10} tristimulus values, the chromaticity coordinates would be x_{10} y_{10} z_{10}.

The procedure adapted by the CIE was so successful that it has become the universally recognized system for specification and measurement of color from the lighting industry to pigment manufacturing to psychological research in color perception. The CIE procedure converts the spectral distribution into three quantities Y, x, and y. The value of Y gives luminance, which is a quantitative measure of the intensity of light leaving a surface. The perceptual attribute of "brightness," which is not quantitative, is closely related to luminance and is frequently used in its place, though strictly speaking incorrectly. The two other coordinates x and y are the *chromaticity coordinates,* which locate the color (with respect to hue and saturation) on a two-dimensional color map called the C.I.E. *chromaticity diagram.*

It is shown in Fig. 2-10 (23) with the adopted locus of the monochromatic colors and of the extraspectral colors with a purity of unity (by definition). Of course the equal-energy achromatic point plots at E where x = 1/3, y = 1/3. This represents the grays and white because achromatic colors can be produced by an spectral distribution that has the same amount of power at every wavelength. Colors whose chromaticity lies near the achromatic point are unsaturated, while those lying near the perimeter of the diagram are saturated. Complementary colors lie on opposite sides of the achromatic point. Other points indicating energy distributions also standardized by CIE are indicated by A, B, C, and D_{65}; they will be discussed presently. The locus of the blackbody energy distributions is also shown with their temperatures.(24-26)

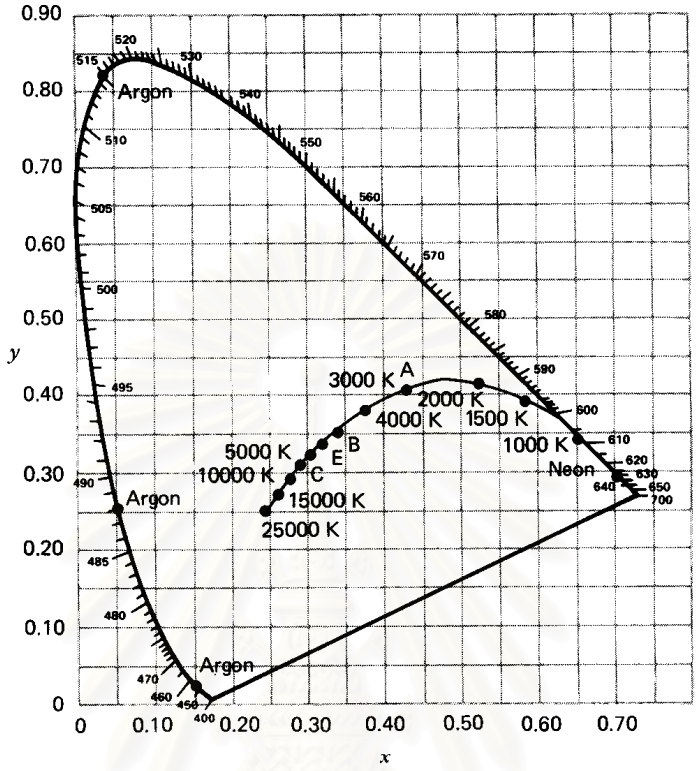


Fig. 2-10 The C.I.E. chromaticity diagram for the X, Y, Z set of primaries. The inside curve shows the chromaticities of incandescent sources at the indicated color temperatures. The C.I.E. Standard Illuminants are denoted by A, B, C and E. The chromaticities for laser light from a neon laser (633 nm) and the green, blue, and indigo lines from the argon laser (515 nm, 488 nm, and 458 nm) are also shown.

As we noted in the previous paragraph, that present the C.I.E. chromaticity diagram on the two-dimensional color map. There were three person developed the theory of optimal color stimuli the first by Schrödinger(1920a) and later by Rösch (1929) and McAdam(1935a,b). McAdam computed chromaticity loci of optimal color stimuli as a function of Y, on the basis of the CIE 1931 standard observer and for incdent radiant power from standard illuminant A and C, respectively. McAdam's

computation have been repeated for illuminants A and D_{65} with updated input data. The chromaticity loci are shown in Fig 2-11(27) and 2-12(28).

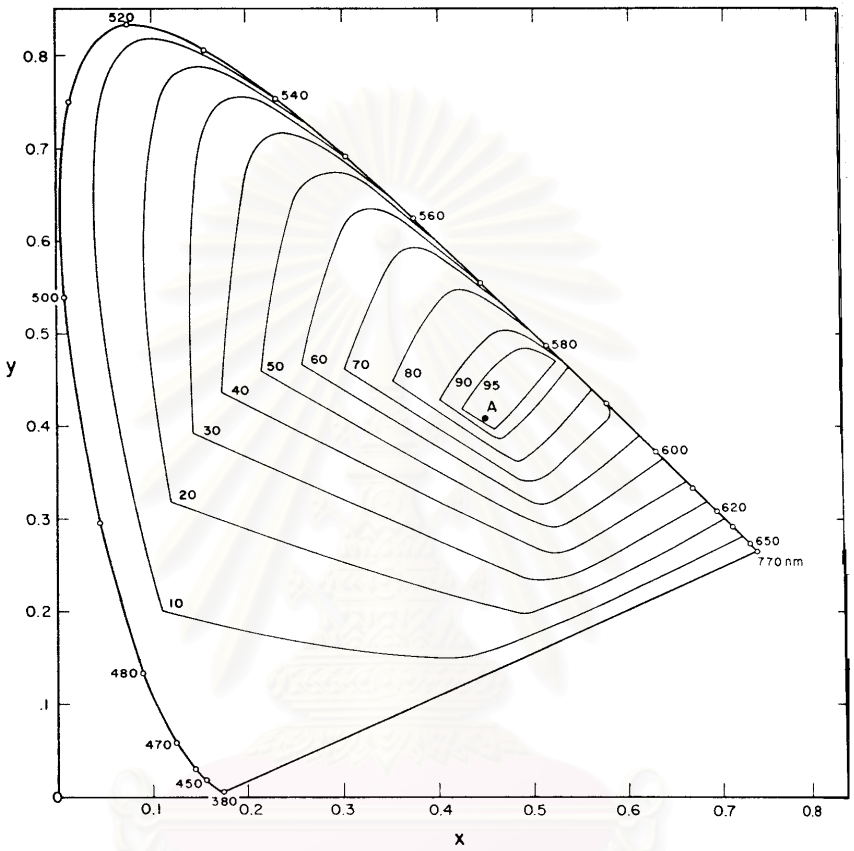


Fig. 2-11 Chromaticity loci of optimal color stimuli as a function of Y, on the basis of CIE 1931 standard observer and for incident radiant power from the CIE standard illuminant A.

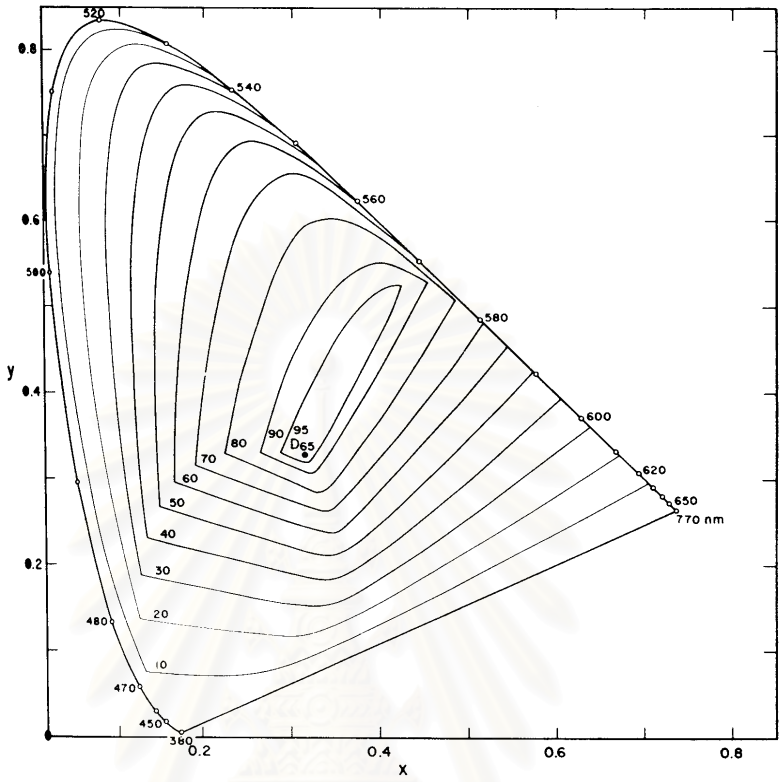


Fig. 2-12 Chromaticity loci of optimal color stimuli as a function of Y, on the basis of CIE 1931 standard observer and for incident radiant power from the CIE standard illuminant D_{65}.

In the American literatire, these loci are often called the McAdam limits. An oblique projection of the (x, y, Y)- space, showing the boundary surface representing the optimal color stimuli for illuminant D_{65} is given in Fig. 2-13(29). In the German literature, the (x, y, Y) object-color solid is known as the Rösch Farbkörper (Rösch color solid).(30)

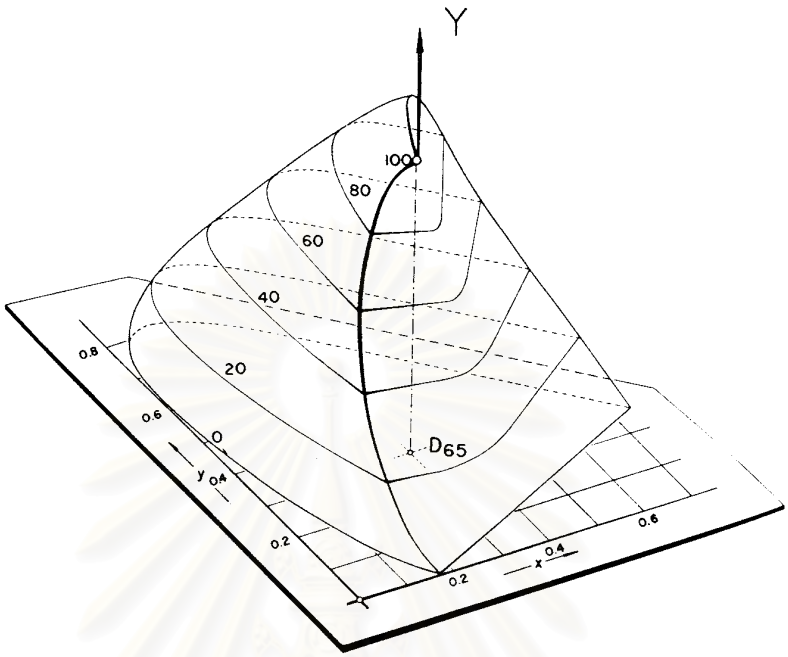


Fig. 2-13 Oblique projection of the (x, y, Y) object-color solid showing the boundary surface representing the optimal color stimuli (Rösch color solid)

2.1.2.4 Comparison with Psychological Attributes

A color space is most useful if it has a direct correspondence with how we perceive colors. Do equal distances between various points correspond to equal differences in their attributes? One way to examine this question is to measure how far we must go from a given chromaticity in various directions to just perceive a difference in color. Fig. 2-14 (31) shows the results for various positions in color space. The axes of the ellipses show how far from the center the chromaticity must deviate before a difference is perceived. For clarity, the size of each ellipse has been increased by a factor of ten. Evidently, distance on the chromaticity diagram is not a fair measure of the noticeability of color differences. Small deviations in position are

more easily perceived for chromaticities toward the bottom of the diagram; equal distances on the diagram do not mean equal visual differences.

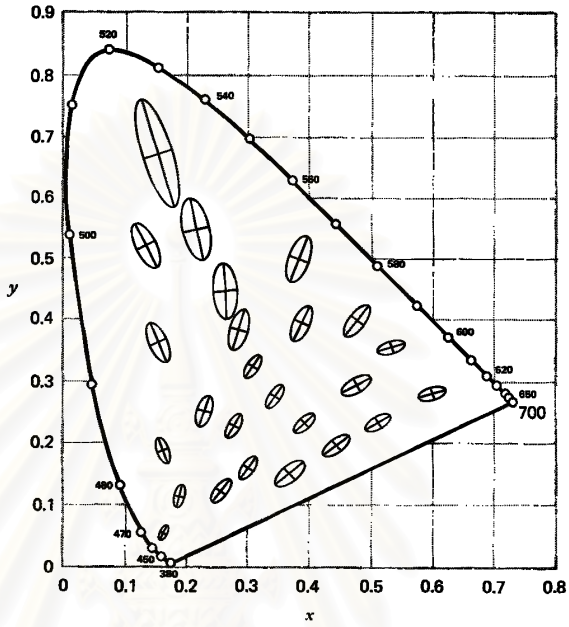


Fig. 2-14 Inaccuracy for color matches at various chromaticities. The lengths of the axes in each ellipse indicate the distance on the chromaticity diagram for which the color is just noticeably different from the color at the center of the ellipse. For clarity, the size of the ellipses has been expanded by a factor of ten; therefore the actual distances on the diagram would be ten times smaller than shown. (From MacAdam, *Journal of the Optical Society of America, 32, 1942, p. 247.)*

A second comparison can be made with respect to chromaticity attributes as expressed, for example, by variables in the Munsell color system. Fig. 2-15 (32) shows curves of chromaticities of constant Munsell Hue radiating from the achromatic point. If Hue were identical to the psychophysical variable of dominant wavelength, these curves would all be straight lines. The diagram shows they are nearly straight, but not exactly. The region of yellows shows closest agreement. In fact the Munsell system was revised to obtain reasonably good agreement in this

fashion after it was discovered that several of the original samples deviated considerably from these smooth curves. The presently accepted Munsell samples are described by Hue and Chroma in this revised notation.

If Munsell Chroma were identical with the psychophysical purity, a curve of constant Chroma would encircle the achromatic point and would have approximately the same shape as the perimeter (the spectrum locus plus the line of purples). This is clearly not the case in Fig. 2-15, because the contours do not extend sufficiently far toward the upper left and go too far toward the right. There is rather poor correspondence between Chroma and purity.

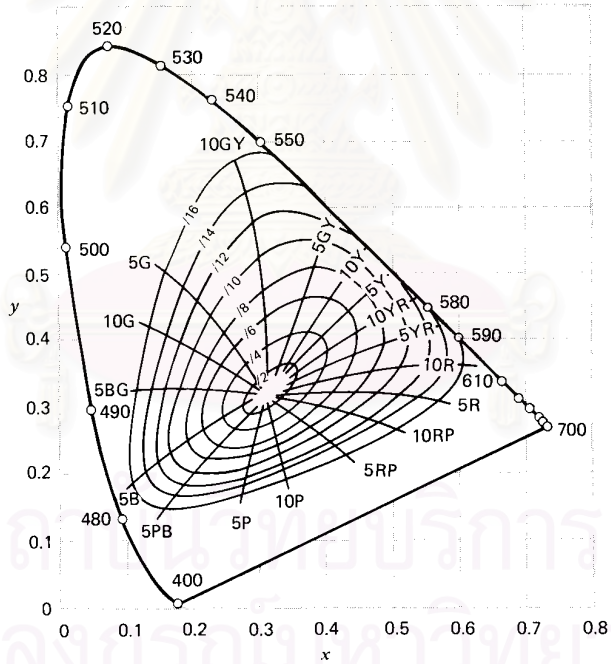


Fig. 2-15 Radiating from the achromatic point are curves denoting colors judged to have constant Munsell Hue at Value 5. Circling the achromatic point are curves of constant Munsell Chroma. Munsell notation is used to indicate Hue and Chroma. (After S. M. Newhall, D. Nickerson, and D. B. Judd, *Journal* of *the Optical Society* of *America 33,* 385, 1943.)

The lack of precise correspondence between visual attributes and colorimetric specifications encourages continued research in color science to find a better arrangement of color space. In the meantime the 1931 C.I.E. chromaticity diagram is generally used for the precision it offers in color measurement. It also makes clear from the position of chromaticities and the "straight-line" rule for color mixing why psychologists have developed the following conclusions pertaining to additive color mixing:

1. A spectral hue has the maximum possible saturation for that hue.
2. The mixture of two spectral colors that are closer together in the spectrum than complementary colors yields a hue of an intermediate spectral color, but less saturated.
3. When two spectral colors are farther apart in the spectrum than complements, the hue may not be spectral at all but a purple.
4. Purples are the only saturated colors that can be made by mixing spectral colors.
5. A range of spectral colors from blue-green (493 nm) to yellow-green (567 nm) have no spectral color as a complement, but the complementary color can be produced by a mixture of red and blue.
6. All possible colors can be formed by additive mixing of various pairs of spectral colors in proper proportion.

The shape of the spectrum locus also explains why saturated red, orange, yellow, and yellow-green surfaces can be produced with a high reflectance, whereas saturated green and blue are much darker. Because of the straightness of the red-to-green locus, light from a large range of wavelengths can be added to produce a color in the yellow that is still almost completely saturated. (33)

2.1.3 *Color Mode*

Attribute of visual perception consisting of any combination of chromatic and achromatic content. This attribute can be described by chromatic color names such as yellow, orange, brown, red, pink, green, blue, purple, etc., or by achromatic color names such as white, grey, black, etc., and qualified by bright, dim, light, dark, ect., or by combinations of such names.

Perceived color may appear in several modes of color appearance. The names for various modes of appearance are intended to distinguish among qualitative and geometric differences of color perception. Some of the more important terms of the modes of color appearance are given in object-color, surface color, aperture color.

Other modes of color appearance include film color, volume color, illuminant color, body color, and Ganzfeld color, Each of these modes of color appearance may be further qualified by adjectives to describe combinations of color or their spatial and temporal relationships. Other terms that relate to qualitative differences among colors perceived in various modes of color appearance are given in luminous(perceived) color, non-luminous(perceived)color, related (perceived) color, unrelated (perceived) color.(34)

Object color

Color perceived as belonging to an object.

Surface color

Color perceived as belonging to surface from which the light appears to be diffusely reflected or radiated.

Aperture color

Perceived color for which there is no definite spatial localization in depth, such as that perceived as filling a hole in a screen.

Luminous (perceived) color

Color perceived to belong to an area that appears to be emitting light as a primary light source, or that appears to be spectrally reflecting such light.

Note - Primary light sources seen in their natural surroundings normally exhibit the appearance of luminous colors in this sense.

Non-luminous (perceived) color

Color perceived to belong to an area that appears to be transmitting or diffusely reflecting light as a secondary light source.

Note – Secondary light sources seen in their natural surroundings normally exhibit the appearance of non-luminous colors in this sense.

Related (perceived) color

Color perceived to belong to an area seen in relation to other colors.

Unrelated (perceived) color

Color perceived to belong to an area seen in isolation from other colors.

Light source color

The light source color is literally the color of the light source. (35)

Light color

The light color is the color of light itself. (36)

Illumination color

The illumination color is the color on an object as the color of the illumination that is shining the object when someone see the object.(36)

2.1.4 *Explanation of Color Mode by the RVSI.*

There are two phenomena, lightness constancy and color constancy should to understand before to explain the concept of RVSI

2.1.4.1 Lightness Constancy

The basic phenomenon involved in lightness constancy is the perception that a white or gray in shadow is still seen as white or gray in spite of the fact that, as a stimulus, it may be sending less light to the eye than a darker gray in full illumination. This is anomalous only to those who believe that the stimulus controls the perceptions. The confusing part of it lies in the fact that the extent to which the true object reflectances are seen depends almost wholly on the circumstances, that is, on the extent of illumination perception. An interesting demonstration of this comes again from photography. Any photographic print, or reproduction, consists of a collection of reflection stimuli on paper and, since they are usually viewed in uniform illumination, they tend to be seen as such. The picture, however, usually represents a scene with non-uniform illumination, and so there is a conflict between the reflectance in the print of an illuminated object and the reflectance of the object as it would have been seen with full illumination perception. The appearance of the object in the print, therefore, depends on the extent to which perception of the illumination is possible from the print itself. Briefly, all lighting gradients in a print are amplified, giving the appearance of much greater lighting contrast than was seen in the subject; hence the need for "flash fill light." Any area of the subject in which it is not possible to see the illumination, for instance an unrelated background, must be separately lighted if its true reflectance is to be made evident. Finally the nature of the

photographic medium will affect the illumination perception and hence the lightness perceptions. A scene photographed in black and white will show the least "constancy." The identical scene in color will show very much more, a projected picture still more, and stereo color the most. Restriction to a portion of the scene, however, may still give serious "failures" in such areas as unrelated backgrounds. (37)

The illumination in the environment changes from time to time in brightness and color. For example, if you enter a room where a filament lamp is used for the illumination, it color temperature is different from outside, namely more reddish compared to outside. Every object in the room now reflects more light of long wavelengths. Does an observer perceive them as more reddish compared outside. No, the objects look same in color. This phenomenon is called the color constancy. The eyes adapt to a new illumination instantly so that we can always recognize objects in a same way in spite of change of illumination. There is the brightness constancy or the lightness constancy about the lightness.

2.1.4.2 Color Constancy

When an object is viewed under different lighting conditions, perhaps first in an artificially illuminated interior and then under daylight, its colour appearance often remains surprisingly constant. This phenomenon, called colour constancy, occurs so frequently even for relatively large changes in the level and colour of the illuminant and the background that it soon ceases to be a surprise. Most visual scenes are complex, being made up of many surfaces of varying chromaticity and reflectance and any one of these may be viewed against a different arrangement of the other

surfaces. The average background colour (i.e. the composite effect of all the coloured elements in the scene) will generally approximate to an achromatic surround of low to moderate reflectance. If we restrict ourselves to the appearance of objects subtending a few degrees of angular subtense at the eye, the field size, background chromaticity and relative luminance of the object to the background remains approximately constant. Changes in the illuminant level do not influence these factors and small variations in the illuminant are largely counterbalanced by chromatic adaptation effects of the eye. This invariance in the physical conditions seems to result in constancy of colour perception. This phenomenon is certainly only approximate and many exceptions can be exhibited. For example, if the chromaticity and relative luminance of an object are known a useful prediction of its hue, saturation and luminosity(The luminosity is the quality of surface or source which expresses whether it appears bright or dim)can be made. It is only because of this constancy that a colour appearance specification, that is a psychological rather than a psychophysical specification, has such a wide application.

A number of colour appearance systems have been developed. These can be divided into systems based on (a) an empirical and subjective arrangement of a large number of coloured surfaces; (b) the empirical study of chromaticity differences; and (c) theories of vision which attempt to relate what we see to the psychophysical stimuli. (38)

2.1.4.3 The concept of RVSI

This research is based on the recognized visual space of illumination, RVSI. The concept of RVSI was introduced to express the state of an observer's recognition for a space in term of illumination. When one enters a room he/she almost instantly understands how the room is illuminated, brightly or dimly, or whitely or a little bit reddishly, and so on. This state is expressed as he/she obtained the RVSI in his/her brain, which was constructed based on what he/she saw first in the room, namely the objects, windows and luminaires, which we call the initial visual information. If the surfaces of the objects appear very bright, he/she recognizes that the room is very brightly illuminated and we express the state as that the size of his/her RVSI is large. When all the objects appear to him/her a little bit reddish because of the incandescent light source, for example, he/she understands that the room is a little bit reddishly illuminated. We express the state as that the color property of the RVSI is a little bit reddish. (39,40)

Once the RVSI is established, the lightness and color of objects in the room are judged in relation to RVSI. In other words the appearance of objects and the RVSI must be in accordance with each other If the appearance of an object is too bright compared to the size of the RVSI, the observer feels it is somewhat unnatural and experiences a contradiction. To resolve this condition, the observer concludes that the object is locally illuminated in addition to the main lighting or that the object itself is radiating light, which results in the perception of light source color. If the appearance of the object is within the size of the RVSI, the observer feels it to be natural, and perceives there the object color and can assess its lightness in relation to the size of the RVSI. (40)

2.1.4.4 The relationship between the size of the RVSI and the object color and the light source color.

The relationship between the size of the RVSI and the object color and the light source color. The RVSI is represented by a circle and its brightness size by the radius. An object in the space can be represented by a point within the circle. The lightness of an object is represented by the distance from the center along the radius. A scheme of the assessment of the lightness is illustrated in fig 1. An object T, is included inside the RVSI and it gives the object color of a certain lightness, high when it is near the circumference and low when it is near the center. An object T_{out}, on the other hand, is plotted outside of the RVSI and the situation indicates that the appearance of the object is the light source color. (40)

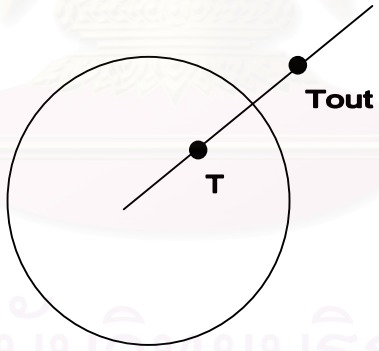


Fig.2-16 A scheme showing the determination of apparent lightness.

2.2 Literature Review

Ikeda et al. (39), The three dimensionality of the recognized visual space of illumination proved by hidden illumination used a hidden illumination a color chart alone in the room where other objects were illuminated by usual ceiling lamps.

The hidden illumination was not recognizable to the observer. The appearance of the color chart placed within the hidden illumination was judged referring to the already constructed RVSI for the room. The lightness of the color chart appeared higher than its own lightness by the amount which depended on the level of the hidden illumination. They did not, however, increase the hidden illumination to obtain the light source color and the border of the color appearance from the object color to the light source color was not investigated. Here in this research we systematically increase the illumination applied only on the color chart and the position of T in

Fig. 2-16 is gradually shifted forward outside the RVSI. The transition point from the object color to the light source color thus can be obtained.

Yamauchi et al.(5) Effects of Chromaticity on the Upper Limit of Luminancefor Surface Color Mode Perception.

The upper-limit of the luminance which yielded surface-color mode perception was measured to investigate effects of chromaticity of stimuli for the surface-color mode Perception. The stimulus consisted of a 3 X 3 array of color chips and a white frame on a large gray background. The test stimulus was presented with a CRT monitor, and the surrounding stimulus was presented either with Munsell color chips or with a CRT monitor. The results show that the upper limits of the luminance differ depending on the chromaticity of the test stimulus. Brightness of the stimulus at the upper-limit luminance was almost equal among all test chromaticities. Moreover,

it was almost equal to that of the brightest surrounding stimulus. Our results suggest that brightness determines the mode perception, and the brightest stimulus may work as a determining factor.

Ikeda et al. (41): Equivalent Lightness of Colored Objects of Equal Munsell Chroma and of Equal Munsell Value atVarious Illuminances

Equivalent lightness was determined for 26 colored surfaces by heterochromatic brightness matching with a gray scale. The illuminance for observation was varied from 0.01 to 1000 lux cover scotopic, mesopic, and photopic vision, and the equivalent lightness-versus-log illuminance curve was obtained for every stimulus. The shape of the curves did not change if the surfaces had the same Munsell hue and chroma. It differed significantly if they had different hues or different chroma. The curves were interpreted in terms of achromatic lightness and chromatic lightness, which are both subject to change with illuminance level. The achromatic lightness was assumed to follow the Purkinje (Appendix A) shift and the chromatic lightness monotonically increased with illuminance. The chromatic lightness was larger for larger Munsell chroma within a single hue.

Lightness of a surface is defined as the brightness of an area judged relative to the brightness of a similarly illuminated area that appears to be white or highly transmitting (meaning of lightness by CIE and IEC) The CIE also defines a formula to calculate the lightness L* but the formula does not necessarily reflect the brightness of a surface and it particularly underestimates the brightness of colored surface,

The equivalent lightness L^*_{eq} was introduce to meet the saturation. It is the lightness of a gray scale that matches an object in brightness when the two are compared side by side.

The equivalent lightness L*eq is written as

$$L^*_{eq} = L^*_{ach} + L^*_{chr} \quad (1)$$

L^*_{eq}= The equivalent lightness

L^*_{ach} = The achromaticness,

L^*_{chr} = The chromaticness

And the achromatic lightness changes from the scotopic lightness(L*') to the photopic lightness (L*) when the illuminance increase from an extremely low level to a high level, expressed

$$L^*_{ach} = aL^{*\prime} + (1- a)L^* \quad (2)$$

So that

$L^*_{eq} = L^* + L^*_{chr}$; a = 0 when illuminance ≥ 2 lux (Photopic vision) (3)

$L^*_{eq}=(aL^{*\prime}+(1-a)L^*)+L_{chr}$; 0<a<1when 0.2 lux < illuminance < 2 lux

(Mesopic vision) (4)

$L^*_{eq} = L^*$; a = l when illuminance ≤ 0.2 lux (Scotopic vision) (5)

When color objects have different lightness but the same chromaticness. Their L^*_{eq}-versus-log E (log illuminance) curves should have the same shape but differ only in their vertical position. On the other hand, if objects have the same lightness and hue, but different chromatieness, the resultant curves should reflect only the effect of the chromaticness on the equivalent lightness.

The present experiment was conducted to confirm these predictions by selecting 26 suitably colored chips and determining their equivalent lightness under various illuminances.

CHAPTER 3

EXPERIMENT

3.1 APPARATUS

The experimental apparatus is composed of Room A and B separated by a wall having a small square aperture A as shown in Fig. 3-1. The size of room A is 1 m wide, 1.5 m long and 2.4 m high and it simulates a living room having being decorated by artificial flowers, dolls, books, framed pictures and others. The colors of these objects were selected so that they cover various hues. The room was illuminated by the fluorescent lamps of the day light type FL and they were controlled by a rotary switch so that the room illuminance was adjusted at any level. The illuminance was measured by the colorimeter Minolta CL-100 placed on a table as seen in the figure.

A subject sat in Room A and consequently he/she constructed a RVSI in his/her brain for this room. At the subject's eye level an aperture A of the size 2 cm $\times$ 2 cm was opened on the wall separating the two rooms and he/she could see through the aperture a test chart T placed in Room B. When the subject saw the test chart it appeared as if it was pasted on the aperture. In other words the subject saw a small square patch at the place of the aperture.

To illuminate the test chart a projector P was used. The light from the projector passed through lenses and a circular neutral density wedge filter W and was reflected by mirrors before it reached the test chart. The illuminance on the chart was controlled by the wedge filter and it was operated by the subject through a knob and a

shaft. The luminance of the test chart was measured with a SpectroScan PR650 of Photo Research from the subject's eye position through a large aperture opened by taking off a card of the aperture A.

For the brightness measurement of the test chart the card of the aperture was replaced by another card on which an achromatic N7 chart of the same size as the aperture A was pasted at the right side of the aperture A with a separation of 2 mm.

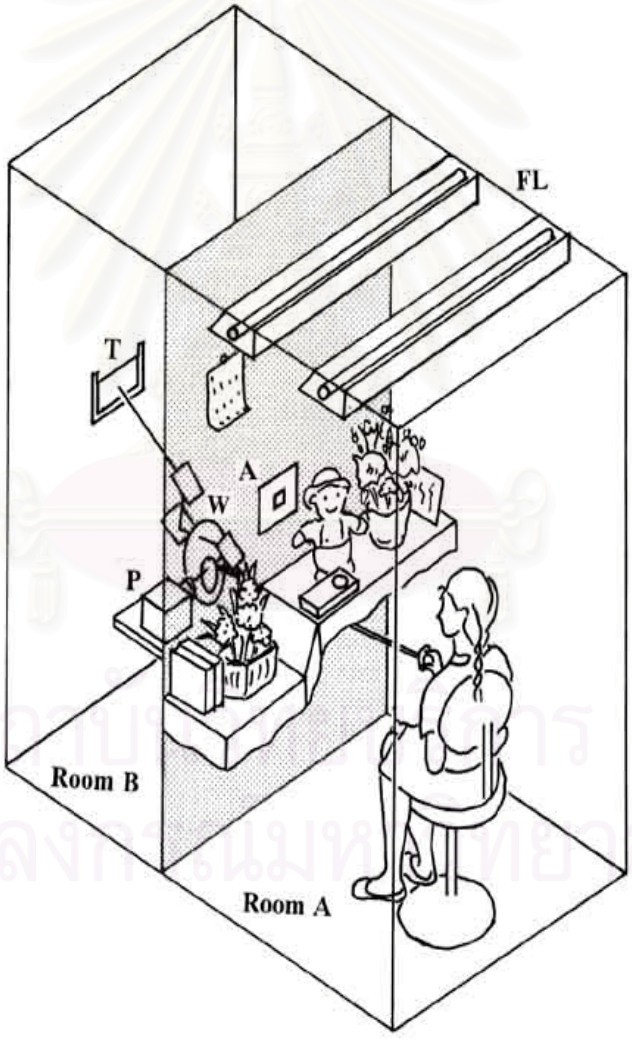


Fig.3-1 Scheme of the apparatus.

3.2 Subject's Tasks

Subjects were engaged in two experiments, border and brightness matching. In the border experiment they were asked to obtain the upper limit of the luminance of the test chart while the test chart still appeared normal as an object in Room A. If the chart appeared too bright as an object placed in the room, it was considered unnatural. If it appeared luminous, it was also considered unnatural. Whatever the subject began to feel unnatural for the test chart it was considered beyond the border of RVSI and the subject should set the wedge filter just below the luminance.

In the brightness matching experiment the subjects were asked to match the test chart with the achromatic standard white of N7 in brightness by rotating the wedge filter.

Five subjects participated in the experiment; MI (67 years old, male, Japanese), RY (25, female, Japanese), YT (24, female, Thai) and WR (22, female, Thai). The first two were well experienced subjects in this kind of experiment and the third an experienced to some extent, but the rest two were quite naive subjects. All the subjects had normal color vision.

Each subject repeated the determination for each test chart for ten times as separated sessions for both the border and brightness matching experiments.

3.3 Test Charts and Experiment Condition.

Thirty-nine colors were selected for the test chart and their nominal Munsell HVC are shown in Table 3-1. The light from the projector to illuminate these charts had the color temperature of about 3500K while the light in the subject's room had the color temperature of about 6500K shown by D in Fig 3-2 and color of all the charts shifted toward orange when viewed by subjects. Their chromaticity coordinates are shown in Fig. 3-2, too .We selected these charts in intention to make three different saturation contours, of about Chroma 3, 6 and 10 as seen in Table 1, but because of the color shift the intention was not fulfilled.

Two levels of room illuminance were investigated, 5 and 50 lx.

Table 3-1 Nominal Munsell HVC of 39 test charts.

No.	Munsell	No.	Munsell	No.	Munsell
1	5R4/10	14	10B4/10	27	5GY5/6
2	10R4/10	15	5PB4/10	28	5G5/6
3	5YR5/10	16	10PB4/10	29	5BG5/6
4	10YR5/10	17	5P4/10	30	5B5/6
5	5Y7/10	18	10P4/10	31	5PB5/6
6	10Y7/10	19	5RP4/10	32	5P5/6
7	5GY6/9	20	10RP4/10	33	5RP5/6
8	10GY6/10	21	10RP3/8	34	5R5/3
9	5G5/10	22	5R5/6	35	5Y5/3
10	10G5/10	23	10R3/4	36	5G5/3
11	5BG4/9	24	5YR5/6	37	5B5/3
12	10BG4/9	25	5Y5/6	38	5P5/3
13	5B4/9	26	5Y4/6	39	N5

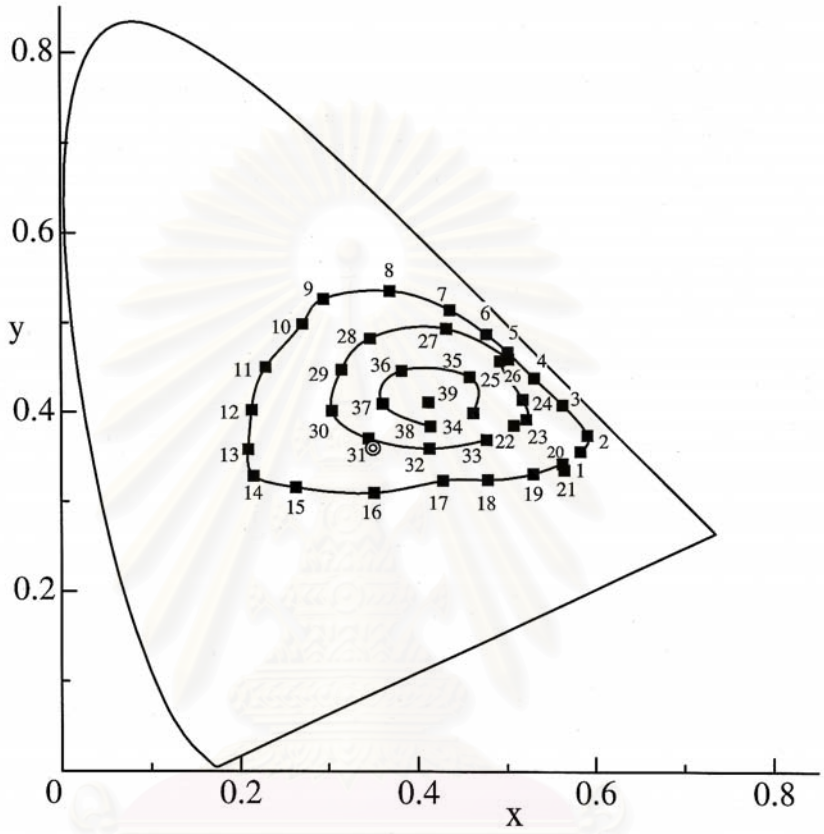


Fig. 3-2 Chromaticity coordinates of the test charts when illuminated by the projector.

3.4 PROCEDURE

3.4.1 *Calibration*

3.4.1.1 The luminance of the test color chart which was controlled by a neutral density wedge filter (Fig.3-3) would be measured by using the colorimeter. The spectrophotometer Spectrascan 650 measured the data at an achromatic chart N9 every 2.5 steps in the wedge scale of 0 – 100 (Fig 3-4). The result is shown in Fig. 3-5. Along the abscissa the wedge reading is taken and along the ordinate the luminance of the N9 chart in cd/m2 in logarithmic unit. There is a good linear property in the wedge reading-log luminance relation.

Fig 3-3 Show the wedge scale of 0-100 for the neutral density wedge

Fig 3-4 Show the neutral density wedge filter.

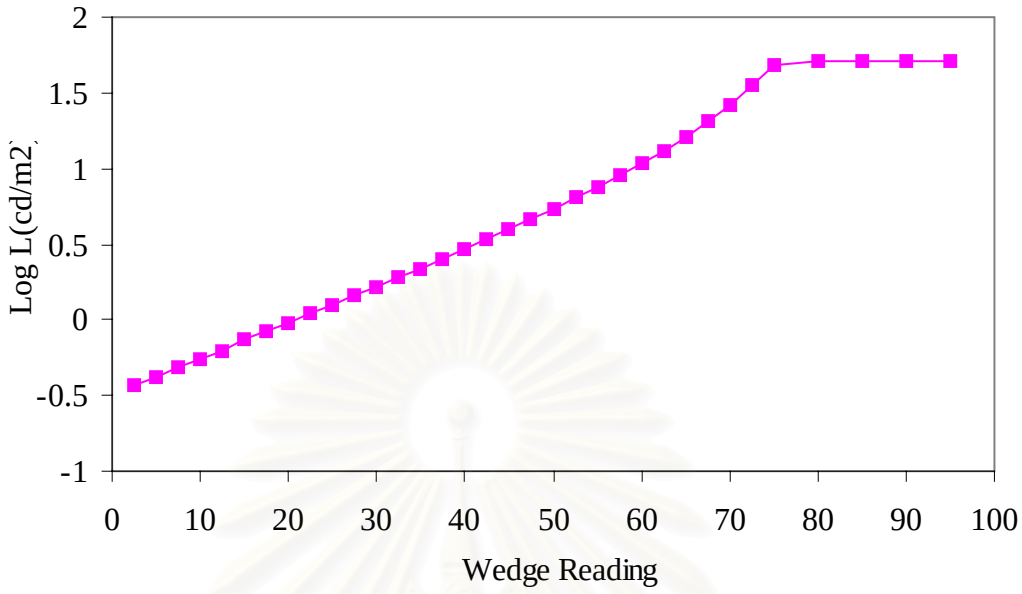


Fig. 3-5 Relationship between the wedge reading and the luminance on the chart of N9.

3.4.1.2 The luminance of neutral density wedge filter each color chart could also be measured in the wedge scale of 80 by the spectrophotometer Spectrascan 650. (See the data in APPENDIX B)

3.4.1.3 The spectrophotometer Spectrascan 650 measured the data at color chart N9 in the wedge scale of 80 before and after the experiment performed for each suject. Because there was the luminance of the projector P lamp variable in experiment.As shown in history of the experiment. (See the data in APPENDIX C)

Then the relation between angle of wedge and luminance were calculated. The luminance of the color chart at the transition point to the light source in the experiment could be evaluated by code N9 of color chart.As shown in part of 3.4.4 Calculate from the wedge scale to log L.

3.4.1.4 The spectrophotometer Spectrascan 650 measured the color of some subjects of different color in the room. (The data in APPENDIX D).

3.4.2 *Experiment*

The observer was asked to sit on a chair in the room A that was illuminated at 5 lx (50 lx. for the second condition). He/she was let to adapt himself to that light condition for minutes. He was instructed to look at the color patch through the rectangular aperture A and adjusted the light intensity on the test color chart by turning the knob connected to the neutral density filter wedge. The color chart appeared, as it was one of the objects in the room. Then the observer increased the light intensity on the color chart slowly, the appearance gradually changed until it reached the point which it did not appear as and object color. It was too bright as an object, it was luminous or looked like a transparent color. It appeared unnatural. The observer would stop turning the knob at this point.

The data was then collected. The experiment was repeated 10 times for each color (see in APPENDIX E). The data of 5 observers were collected and used to obtain the luminance from the calibrated calculation. The relationship between the color charts and the luminance were recorded. Then the observers decided the aperture appearance test when he or she already perceived the aperture A appeared unnatural and light source color. The aperture began to appear too bright as an object in the room, or dazzling, or transparent, or fluorescent.

3.4.3 *Brightness matching*

We obtained the transition point of color charts from the object color to the light source color. It was interesting and worthwhile to investigate what was determining the transition point. One possibility was that the brightness was the main factor to determine it. If the color chart became a certain brightness then it might change from the object color to the light source color. In ordered to investigate this hypothesis, we measured the brightness of the test color charts by using the heterochromatic brightness matching method.

In this method a reference white chart of N7 was pasted on the right-hand of the aperture for the test color chart. The arrangement was shown in Fig 3-6. The light coming from the light control system was placed on the test chart and its illuminance was controlled. The observer compared two charts and controlled the illuminance so that both charts appeared same in “brightness*” not in “lightness**”.

The luminance of the test color chart was corrected by scale. This operation is done for all the color charts used in the main experiment repeated 10 times for each color (see in APPENDIX E part of the brightness matching). The relation between lightness and color chart then was calculation.

* Brightness: Attribute of a visual sensation according to which an area appears to emit more or less light.

** Lightness: The brightness of an area judged relative to the brightness of a similarly illuminated area that appears to be white or highly transmitting.

(Fairchild, M. D., *Color Appearance Models*, Addison Wesley Longman; Massacchusetts, 1997; p 102.)

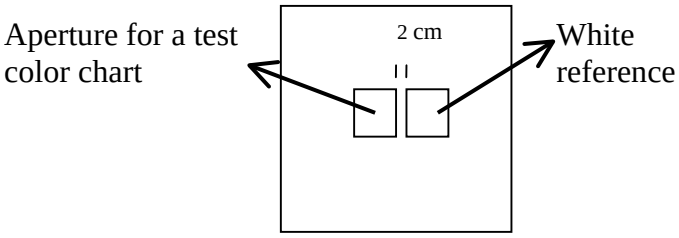


Fig.3-6 A reference white chart of N7 was pasted on the right-hand of the aperture for the test color chart.

3.4.4 *Calculation from the wedge scale to log L.*

The correction data from the scale to log L were calculated by the equation 3.1. The concept of equation was shown in Fig.3-7, the curve of N9 being the same as Fig. 3-5.

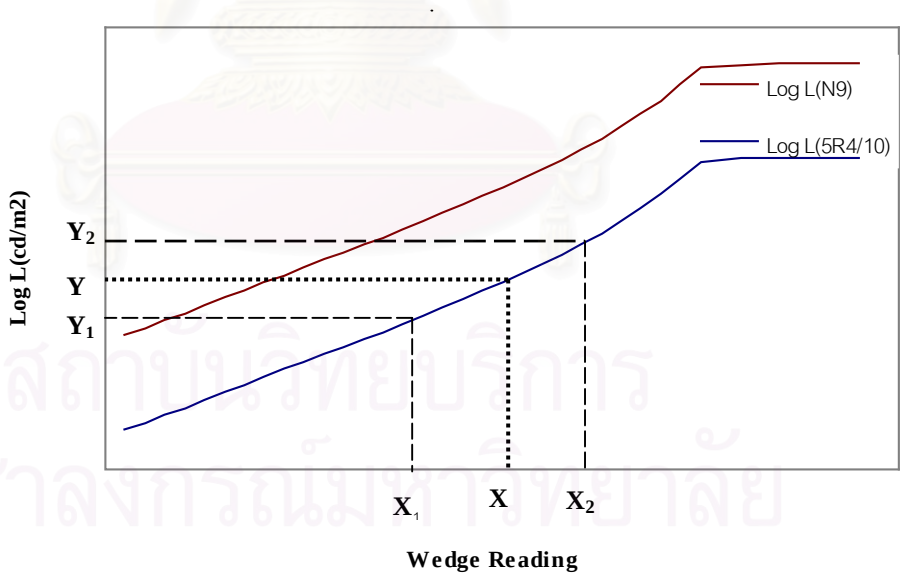


Fig 3-6. The relationship between luminance in log unit and wedge reading.

$$Y = \{Y_1+[(X-X_1)*(Y_2 -Y_1)/(X_1-X_2)]\}*\text{coefficient} \quad (3\text{-}1)$$

$$\text{Coefficient} = \log (Y_c/Y_{n9})*[Y_{(N9)}*\log(Y_{then} /Y_{old})] \quad (3\text{-}2)$$

Y : Log L
Y_1 , Y_2: The log luminance data were related with the data X_1 , X_2 for each color chart
X : The scale was corrected from experiment.
X_1 , X_2 :The scales were scale of wedge.
Y_c : The luminance of the color chart was measured in the wedge scale of 80 from 3.4.1.2
Y_{n9} : The luminance of the color chart N9 was measured in the wedge scale of 80 from 3.4.1.2
$Y_{(N9)}$: The luminance of the color chart N9 was measured every 2.5 steps in the wedge scale of 0 – 100 from 3.4.1.1
Y_{then} : The luminance of the color chart N9 was measured in the wedge scale of 80 when did the experiment in 3.4.1.3
Y_{old} : The luminance of the color chart N9 was measured in the wedge scale of 80 from 3.4.1.1

3.4.5 *To measuring the spectral distribution of the illuminanted test chart at the border viewed from the subject's eye point.*

3.4.5.1 Set the test charts at their border illumination and measure their spectral distribution.

3.4.5.2 Brought these test charts inside the observer's room and hold one by one on the wall near the aperture through which a subject saw the test chart in the experiment, and measure their spectral distribution with the ceiling light used for the experiment.

3.4.5.3 Measured the spectral distribution of a white paper(color chart N9) put on the front wall.

3.4.5.4 Measured the spectral distribution of some subjects of different color in the room.(as shown in Appendix F)

CHAPTER 4

RESULT AND DISCUSSION

4.1 The Border of RVSI

The border of RVSI was obtained by the transition point from object color to light source color. Each determination of the border was not difficult for the subjects and they quickly could set the wedge position for the border. It took only a few seconds for an experienced subject and a little longer for inexperienced subject, say about 15 seconds to make each determination.

The data from all the four subjects are shown in Fig.4–1 to Fig. 4-4, respectively. Their mean is also plotted in Fig. 4-5 and the data in Table 4-1. In the figure (a) the data for the room illuminance 5 lux are shown and in the figure (b) the data for 50 lux are shown. Along the abscissa the test chart number is taken according to Table 3-1 and along the ordinate the border is taken in the luminance (cd/m^2) in logarithmic units. Each point represents the average of ten separate determinations and the vertical lines are the standard deviations. In the luminance region below the border curve the subject perceived a natural appearance on the test charts surface, and in the region above the curve he or she perceived an unnatural appearance on the chart compared to an object in the room. When the subject perceived, through the aperture that the light was either too bright, dazzling, fluorescence, transparent or a combination of these, the experiment was terminated.

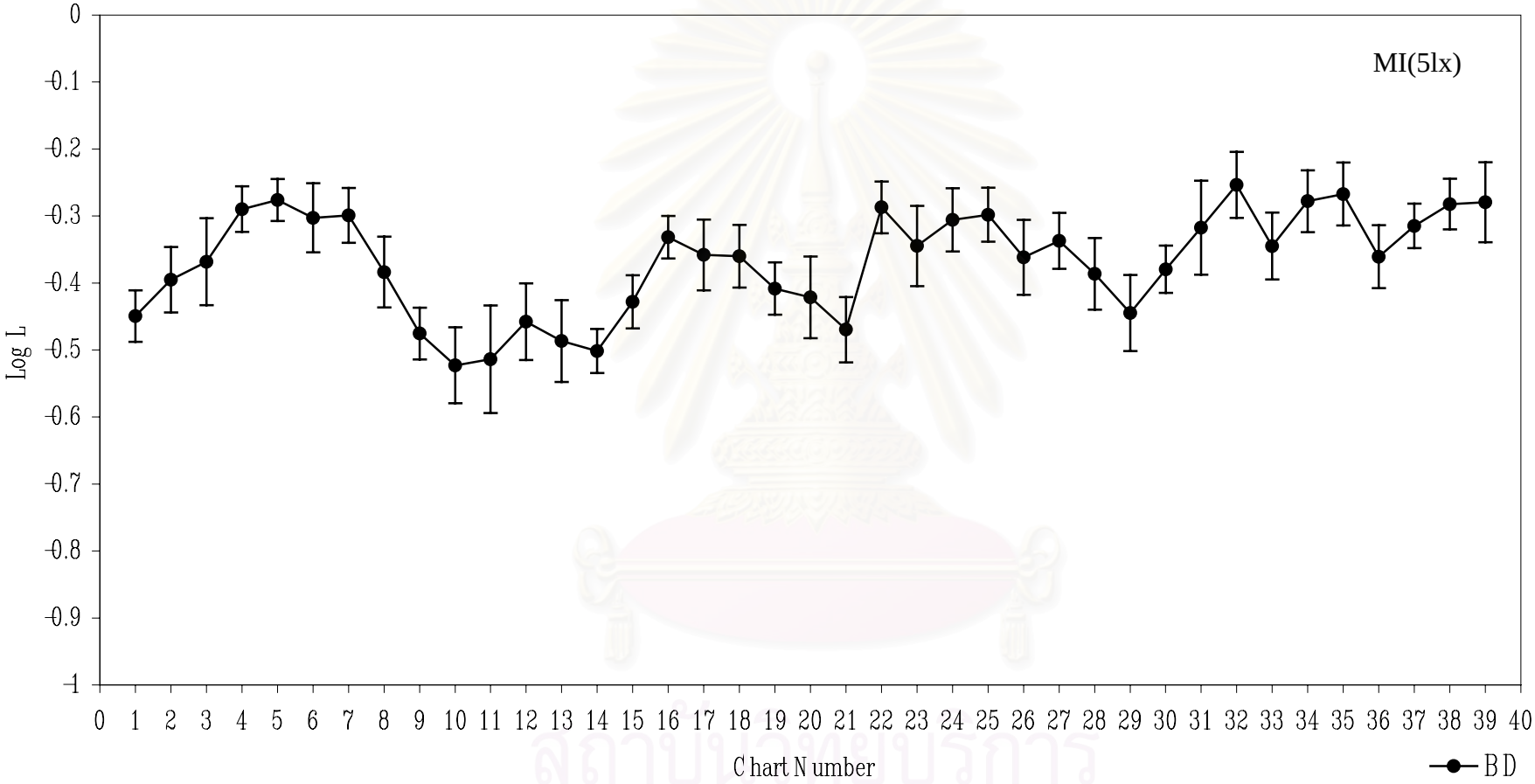


Fig.4-1a Result of the border of RVSI in 5 lux observer's room by subject MI.

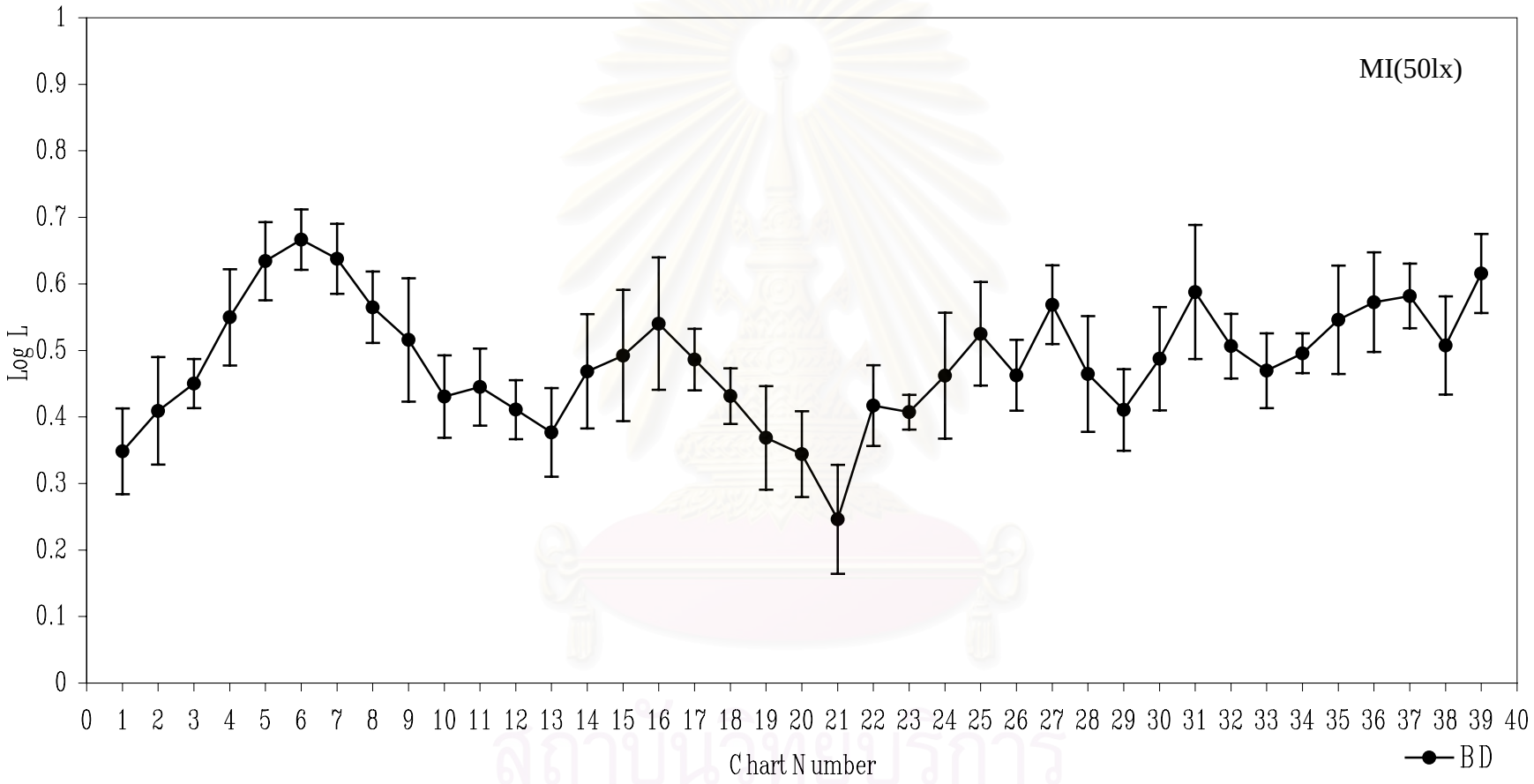


Fig.4-1b Result of the border of RVSI in 50lux observer's room by subject MI.

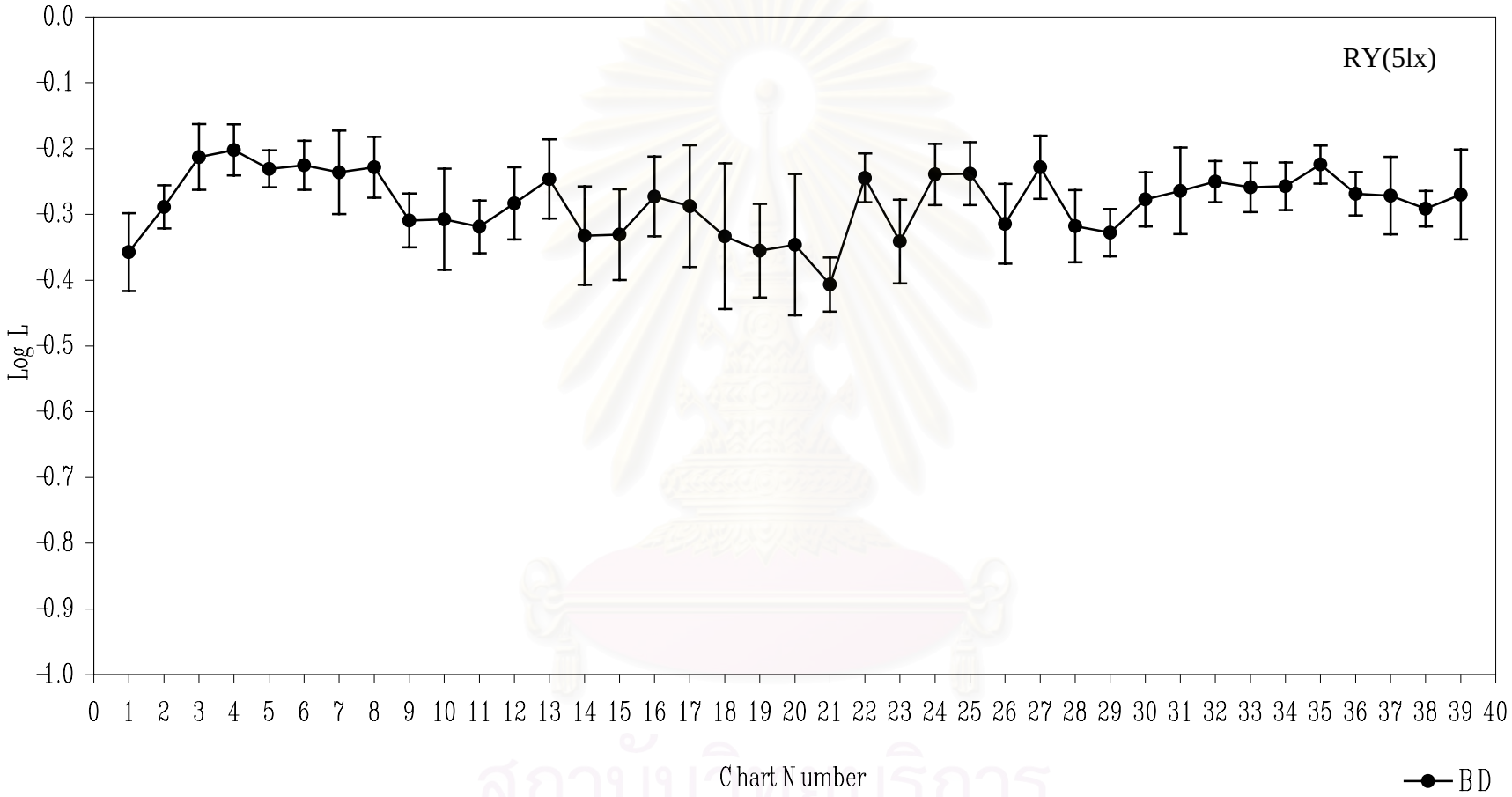


Fig.4-2a Result of border of RVSI in 5lux observer's room by subject RY.

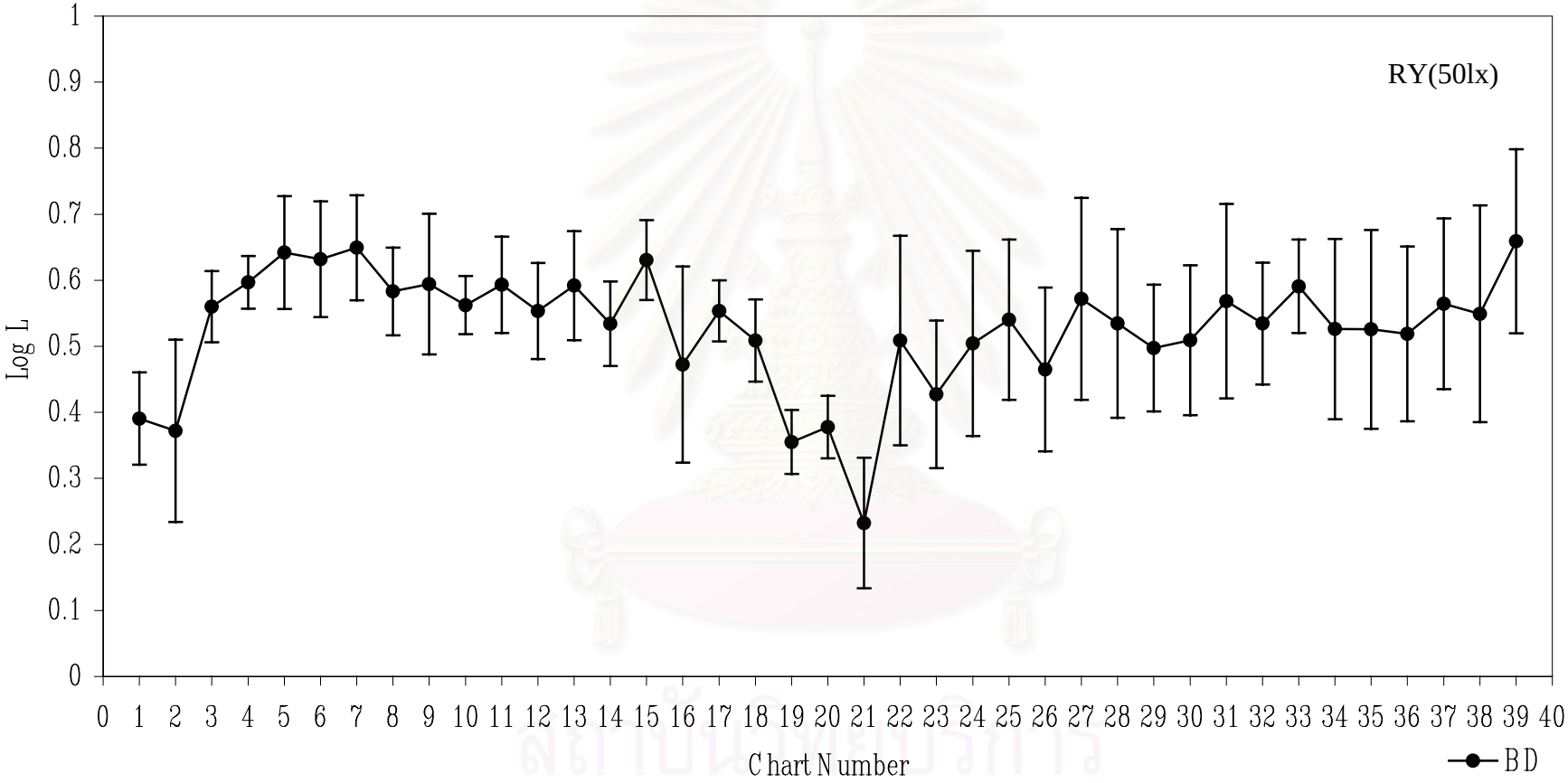


Fig.4-2b Result of border of RVSI in 50lux observer's room by subject RY.

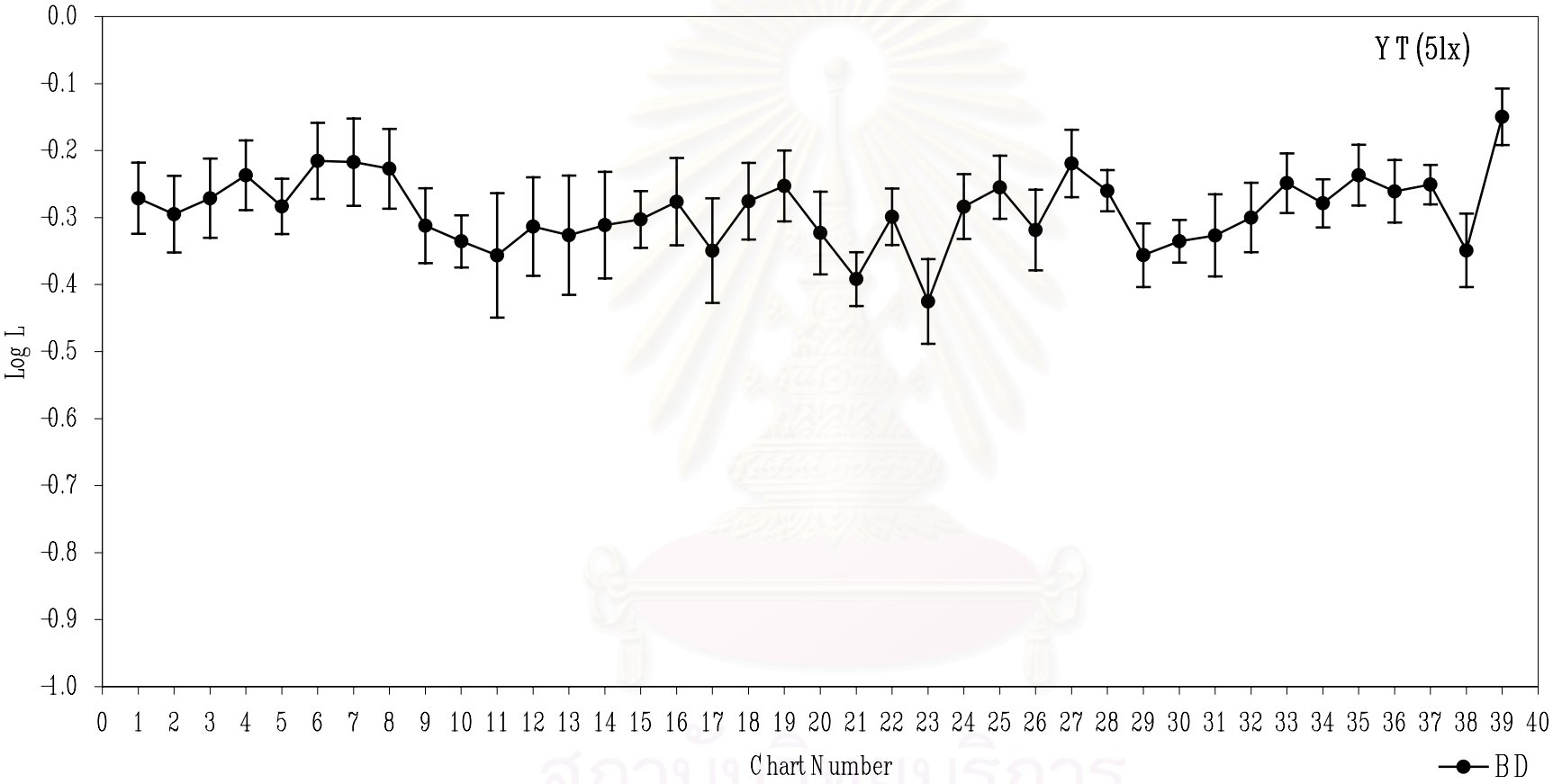


Fig.4-3a Result of border of RVSI in 5lux observer's room by subject YT.

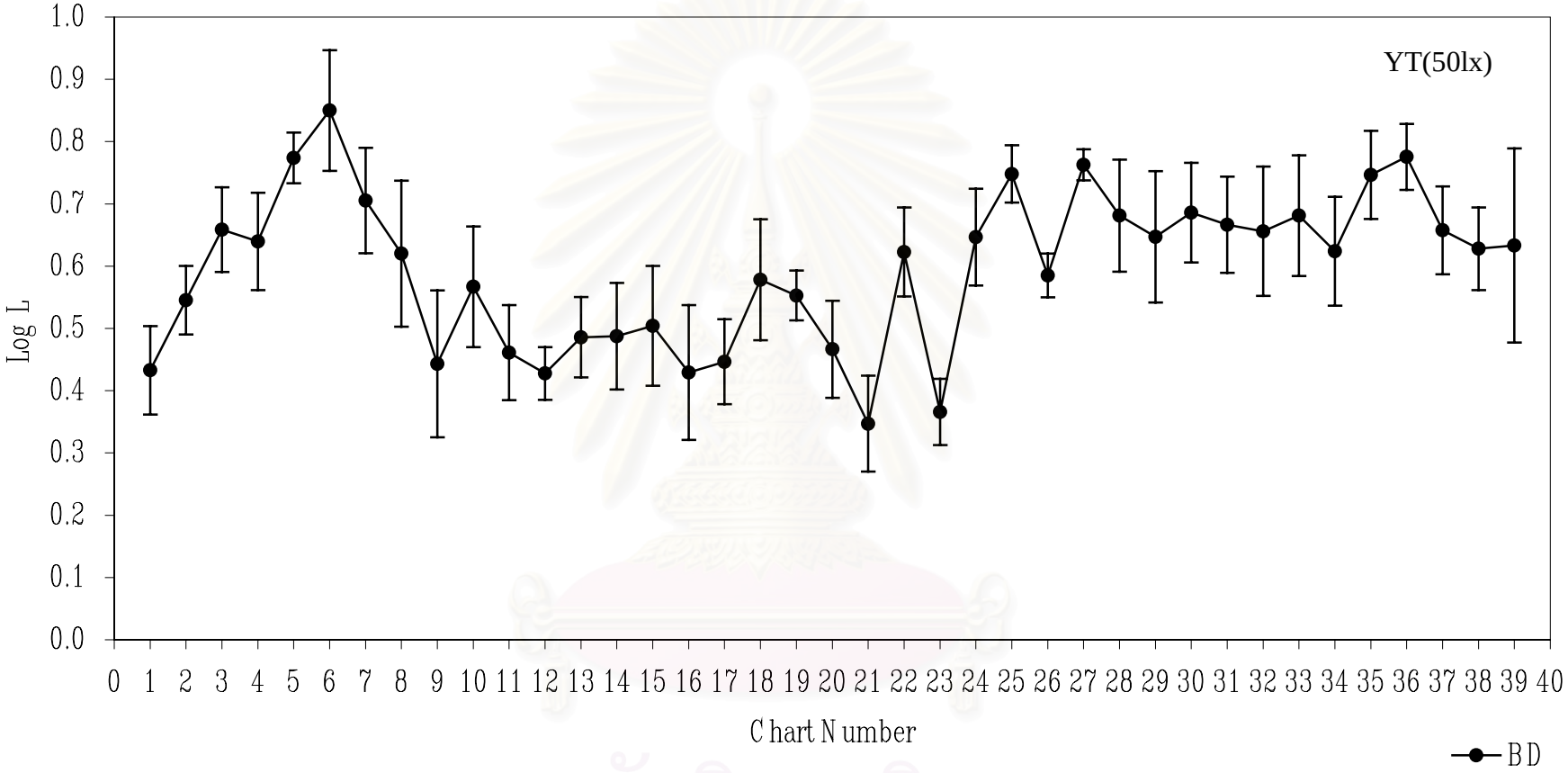


Fig.4-3b Result of border of RVSI in 50lux observer's room by subject YT.

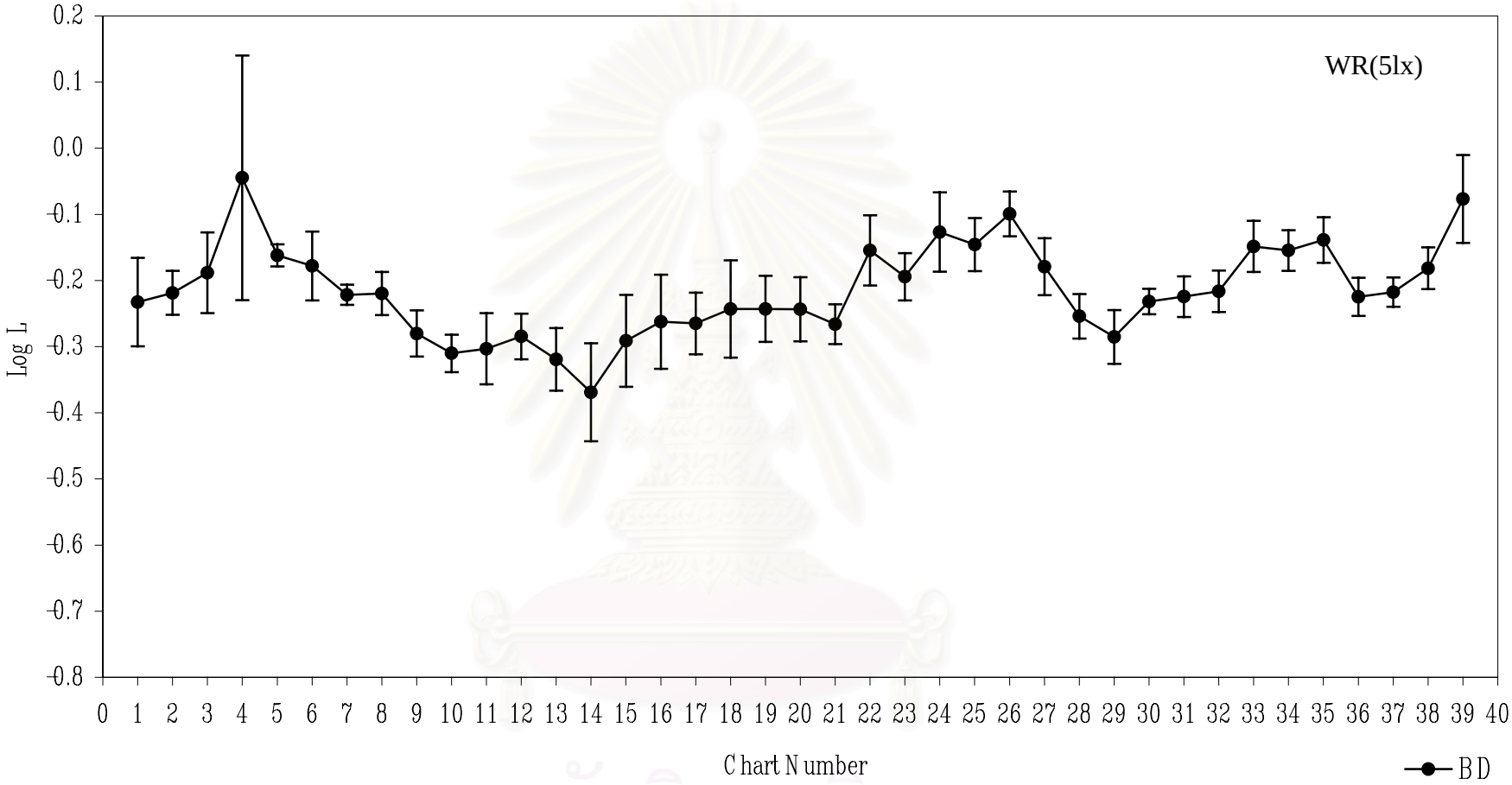


Fig.4-4a Result of border of RVSI in 5lux observer's room by subject WR.

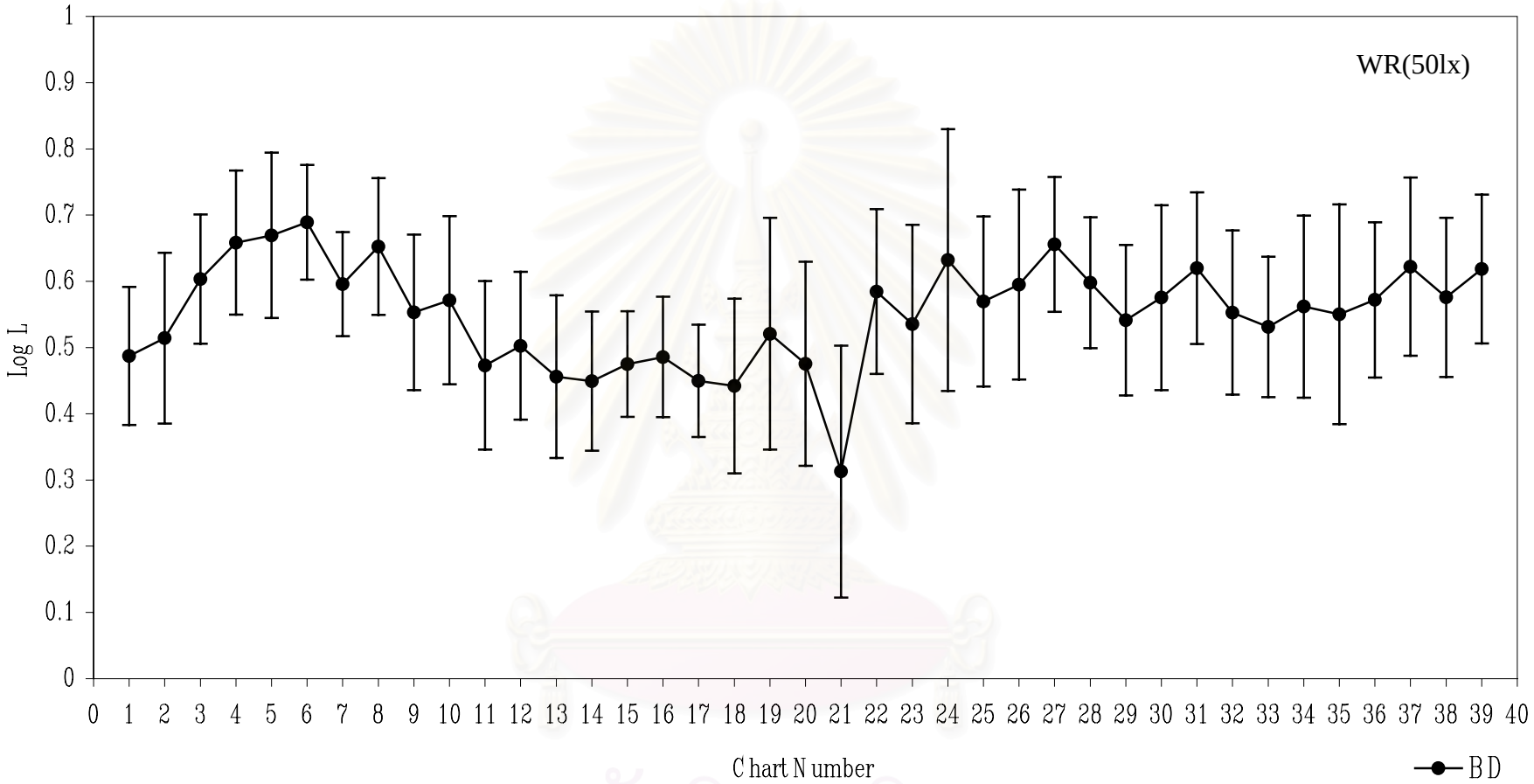


Fig.4-4b Result of border of RVSI in 50lux observer's room by subject WR.

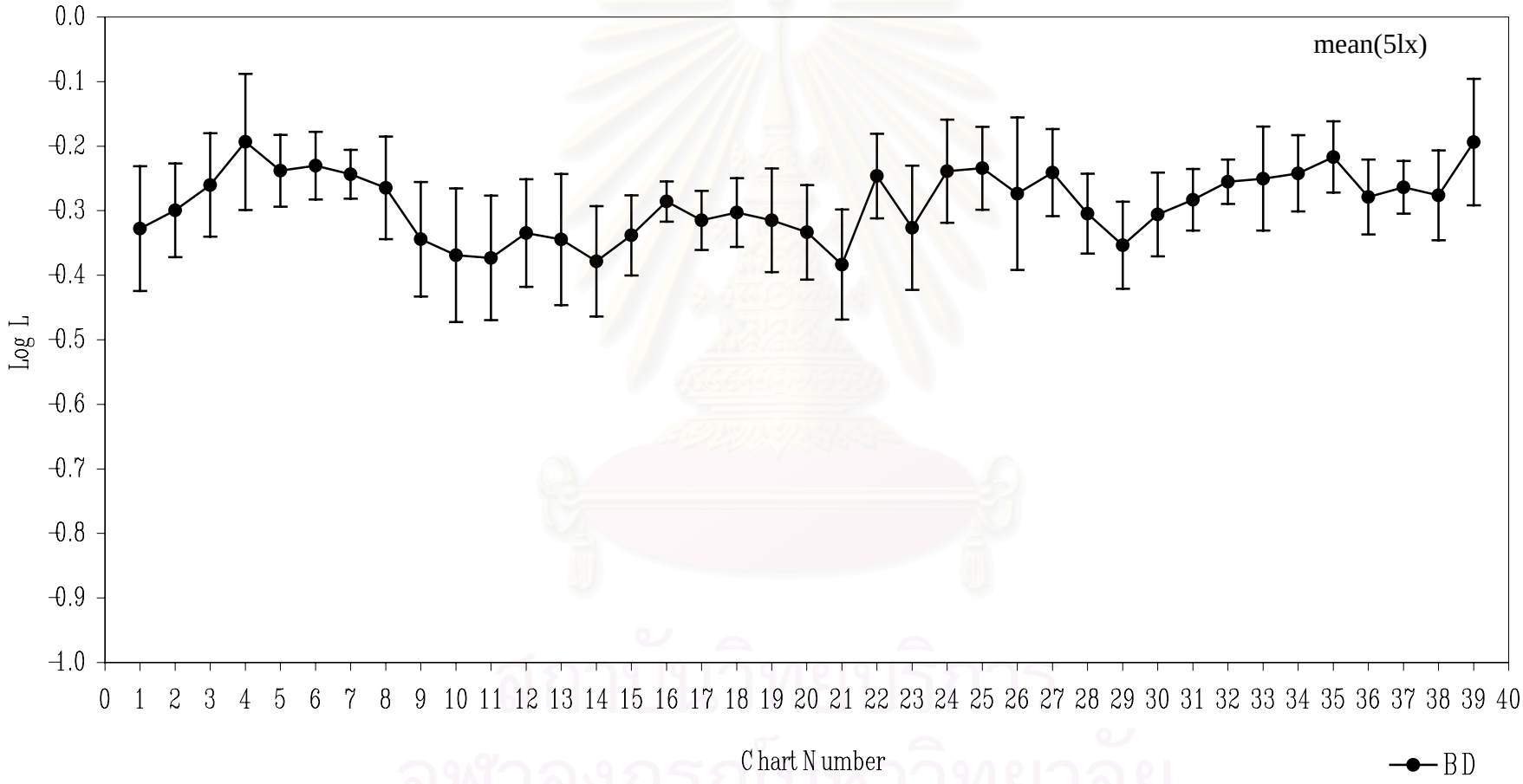


Fig.4-5a Result of mean of border of RVSI in 5lux observer's

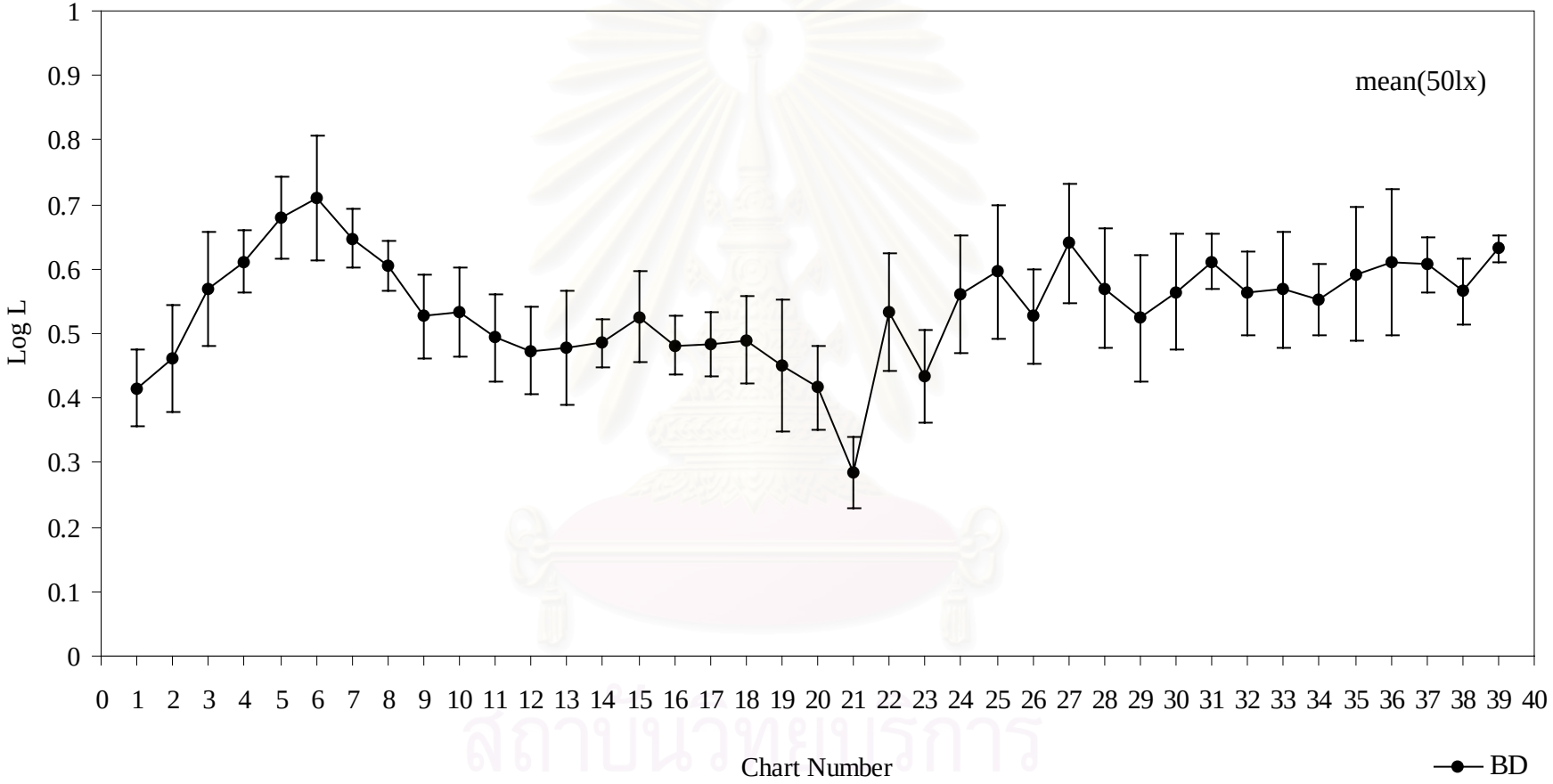


Fig.4-5b Result of mean of border of RVSI in 50lux observer's room .

Table 4-1 The mean data of the border of RVSI from all the four subjects.

No.	HVC	BD-5		BD-50		No.	HVC	BD-5		BD-50	
		cd/m2	Stdev	cd/m2	Stdev			cd/m2	Stdev	cd/m2	Stdev
1	5R4/10	-0.328	0.096	0.415	0.059	21	5YR5/6	-0.384	0.09	0.285	0.054
2	10R4/10	-0.299	0.072	0.460	0.083	22	5R5/6	-0.246	0.07	0.533	0.091
3	5YR5/10	-0.260	0.080	0.568	0.088	23	5R5/3	-0.326	0.1	0.434	0.072
4	10YR5/10	-0.193	0.105	0.611	0.048	24	5RP5/6	-0.239	0.08	0.561	0.092
5	5Y7/10	-0.238	0.056	0.680	0.064	25	5P5/6	-0.234	0.06	0.596	0.103
6	10Y7/10	-0.230	0.052	0.709	0.097	26	5P5/3	-0.274	0.12	0.527	0.073
7	5GY6/9	-0.244	0.038	0.647	0.045	27	5PB5/6	-0.241	0.07	0.64	0.091
8	10GY6/10	-0.265	0.079	0.605	0.039	28	5B5/6	-0.305	0.06	0.57	0.092
9	5G5/10	-0.344	0.089	0.527	0.064	29	5B5/3	-0.354	0.07	0.524	0.098
10	10G5/10	-0.369	0.103	0.533	0.068	30	5BG5/6	-0.306	0.06	0.565	0.089
11	5BG4/9	-0.373	0.096	0.493	0.068	31	5G5/6	-0.283	0.05	0.611	0.043
12	10BG4/9	-0.335	0.083	0.474	0.067	32	5G5/3	-0.255	0.03	0.562	0.065
13	5B4/9	-0.345	0.101	0.478	0.089	33	5GY5/6	-0.25	0.08	0.568	0.09
14	10B4/10	-0.379	0.085	0.485	0.036	34	5Y5/6	-0.242	0.06	0.552	0.055
15	5PB4/10	-0.338	0.062	0.526	0.071	35	5Y5/3	-0.217	0.05	0.592	0.103
16	10PB4/10	-0.286	0.031	0.482	0.046	36	10R3/4	-0.279	0.06	0.61	0.113
17	5P4/10	-0.315	0.046	0.484	0.050	37	5Y4/6	-0.264	0.04	0.606	0.042
18	10P4/10	-0.303	0.053	0.490	0.068	38	10RP3/8	-0.276	0.07	0.565	0.051
19	5RP4/10	-0.315	0.080	0.449	0.102	39	N5	-0.194	0.1	0.632	0.02
20	10RP4/10	-0.334	0.073	0.416	0.065						

It is quite clear that the border is not determined by the luminance of the test charts as the border luminance changes depending on the charts. For examples in the case of the 50 lux condition, the luminance is very low with the red charts 1 (5R4/10) and 2 (10R4/10) but it is very high with the yellow charts 5 (5Y7/10), 6 (10Y7/10) and 7 (5GY6/9). The result of the 50 lux condition is more color dependent as compared to the 5 lux condition. When the observer's room was bright as 50 lux, the luminance of the test charts was made high and consequently their colorfulness became also high. The border must be influenced more by the color in 50 lux compared to 5 lux. We find some difference among subjects in the shape of the border curve. Most of the subjects showed a sharp drop after the charts around 6 reaching the

minimum with the charts at 12 (10BG4/9) (the subject YT), 13(5B4/9) (MI) or 14 (10B4/10) (WR), but the subject RY did not show such a low luminance keeping similar high luminance as in the test charts 5, 6 and 7 as indicated in Fig. 4 – 2b.

All the subjects showed smaller standard deviation for 5 lux compared to 50 lux as shown in Table 4-2. It seems that the border was easier in a darker room because the colorfulness of the objects in the room was lower as compared to the room of 50 lux and the determination of the border was not bothered by the color.

Table 4-2 Standard deviation of ten determinations for border in luminance cd/m^2.

Subject	5 lux	50 lux
MI	0.05	0.07
RY	0.06	0.11
YT	0.05	0.08
WR	0.05	0.13

To see the individual differences the results from the four subjects have been plotted together in Fig. 4-6. There is variation among subjects and we can consider two reasons for the variation. One is the difference in the absolute magnitude of the border luminance and the other is the difference in the shape of the curves. The border luminance is very low for most of the color charts in the subject RY for 50 lux although the shape of her curve appears similar to other subjects. To see the contribution of these two causes we normalized all the curves in the vertical direction as follows. Firstly the average of all the data points was calculated for each subject. Then from the averages of this data it was possible to calculate, total average.

Finally each curve was shifted vertically so that the average of each subject coincided with total the average. The results are shown in Fig. 4-7. Now we see here the individual variation is small at some color test charts and large at others. We then took the average and the standard deviation of the variation and showed the results in Fig. 4-8. The standard deviation is small for the test charts from 1 through 8, and 20 through 22, and 26 through 34 in the case of 50 lux The curve shape of the average at these ranges can be considered as general, but at other ranges the curve shape can not necessarily be considered general. A similar tendency is also found in the case of 5 lux. The test chart ranges mentioned above should be referred to the chromaticity diagram of Fig. 3-2, which will be shown again as Fig. 4-9. Generally speaking there was substantial agreement among subjects for the border for red, orange, and yellow color. The subjects did not agree for purple, blue, and cyan color charts.

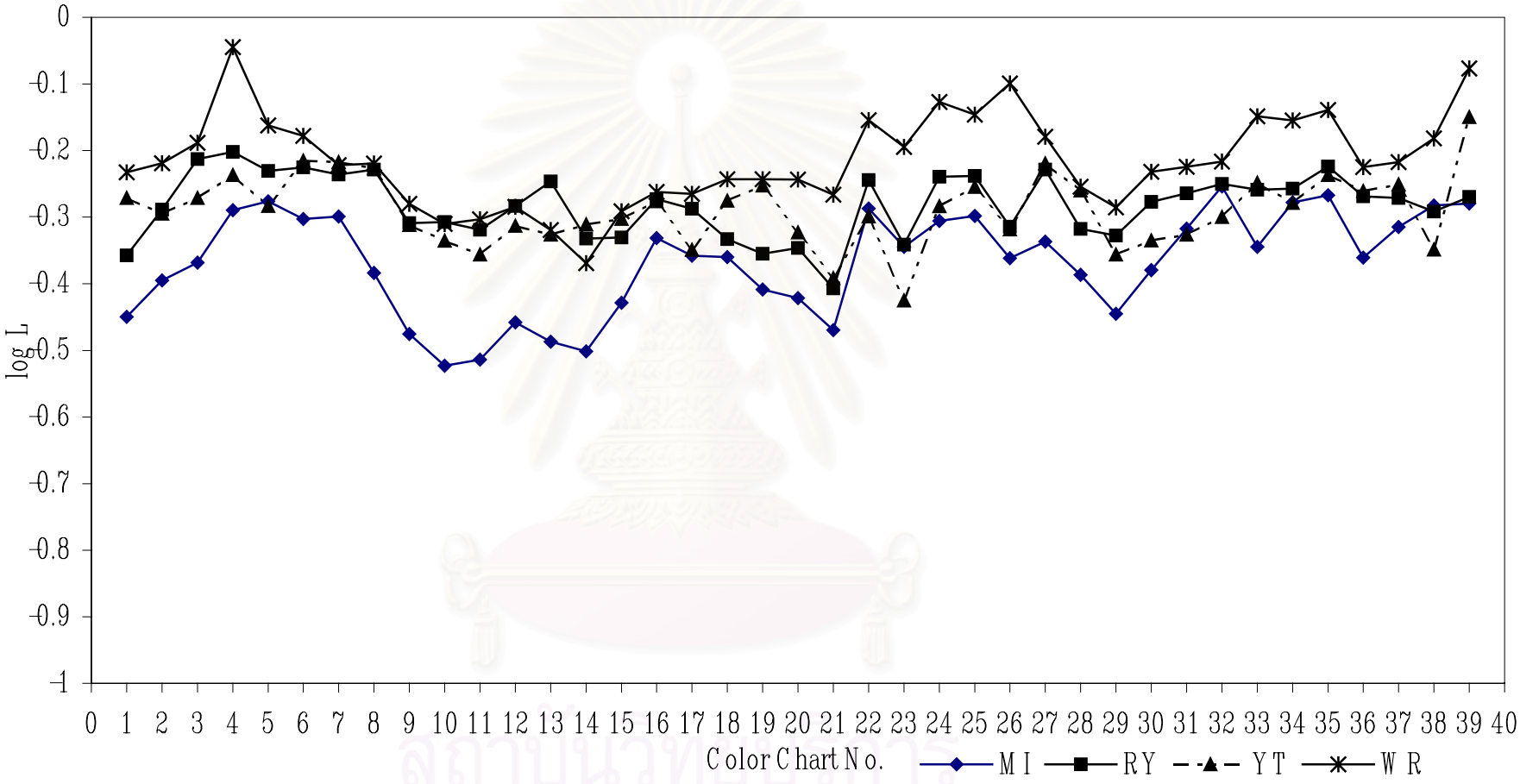


Fig.4-6a Comparison the border of RVSI in the 5 lux observer's room (5 luxBD) for all subjects.

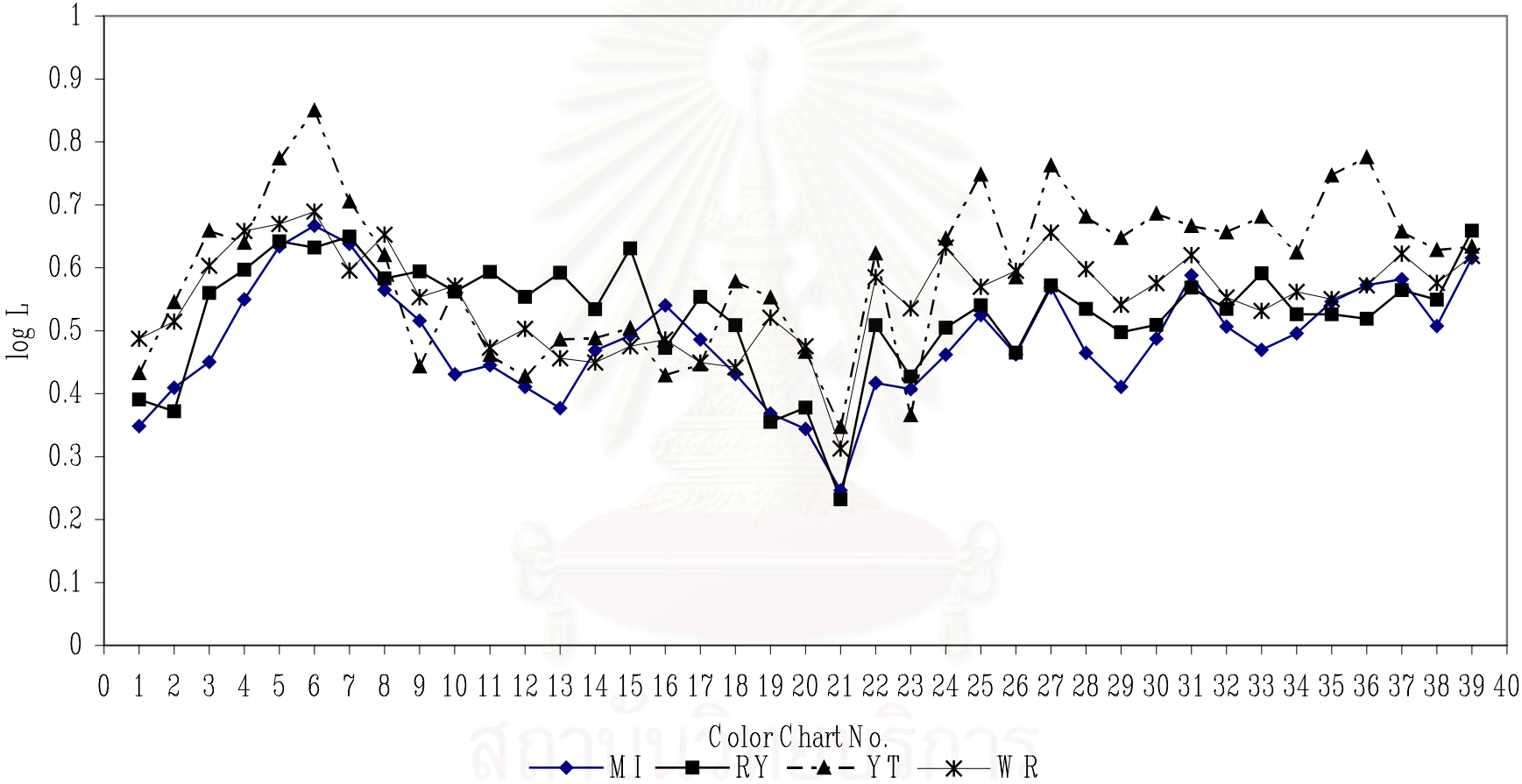


Fig.4-6b Comparison the border of RVSI in the 50lux observer's room (50luxBD) for all subjects.

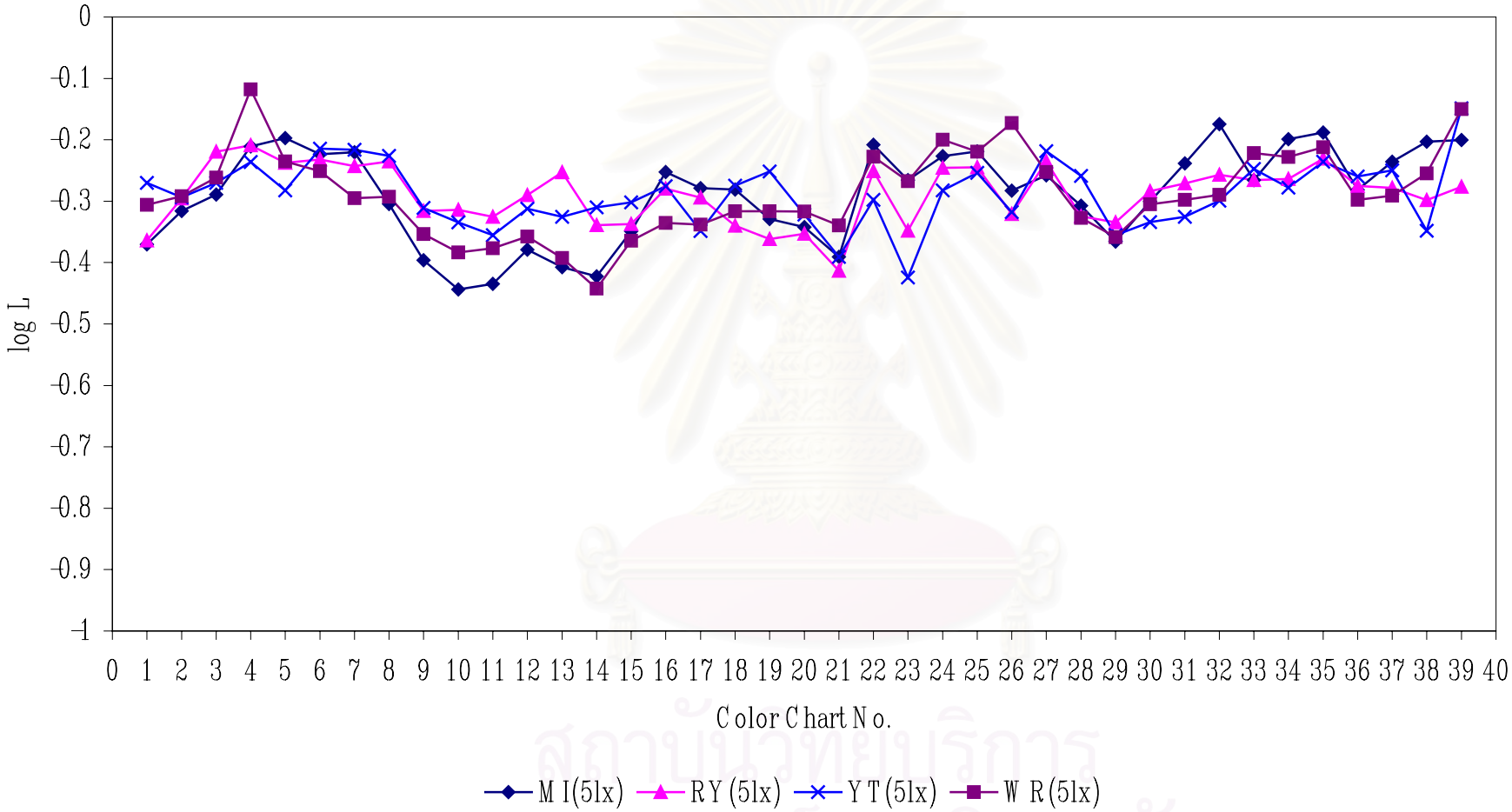


Fig. 4-7a The result of the border of RVSI for each curve was shilfted vertically by the average of each subject coincided with total the average for 5 lux.

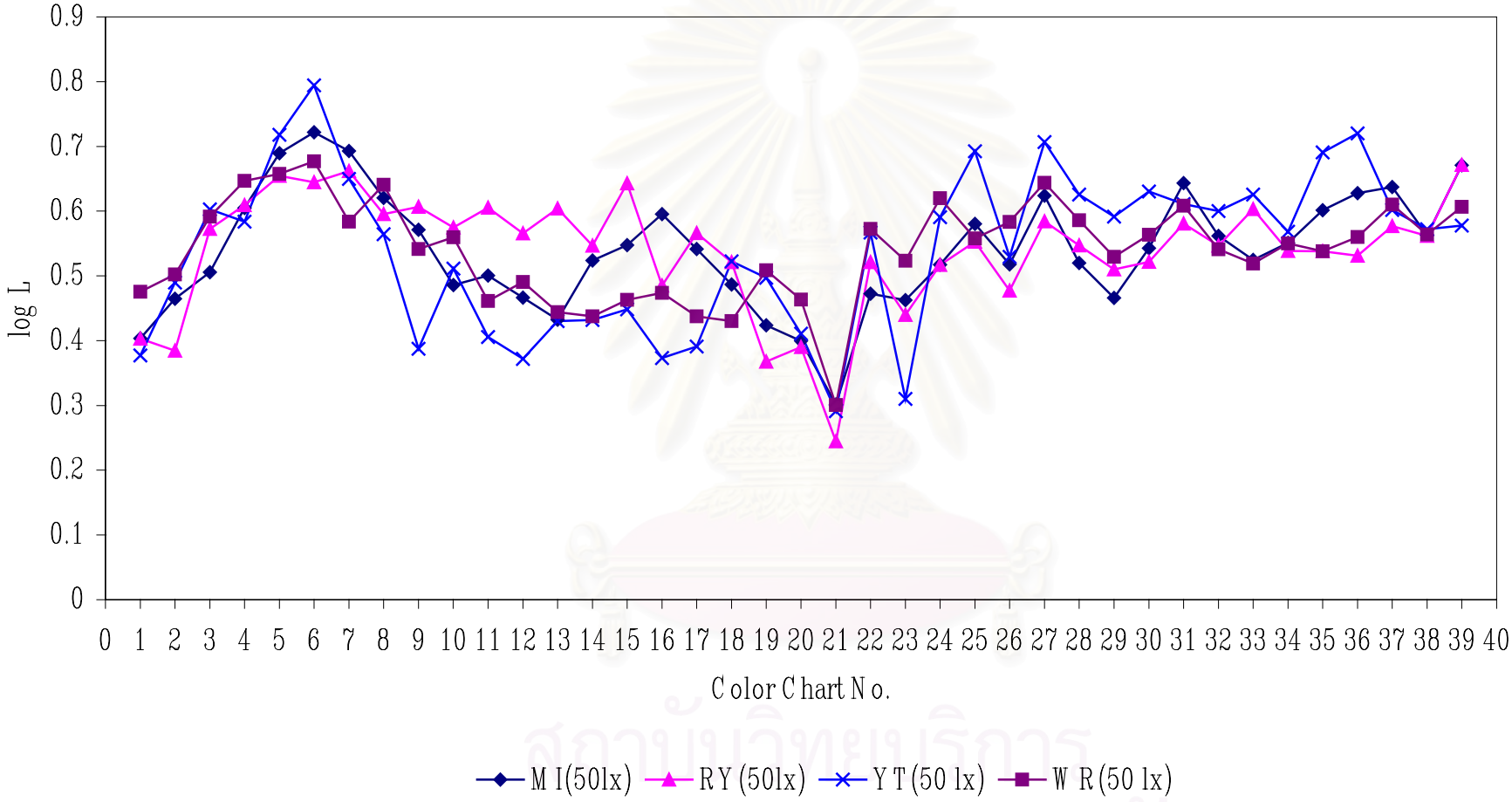


Fig. 4-7b The result of the border of RVSI for each curve was shifted vertically by the average of each subject coincided with total the average for 50 lux.

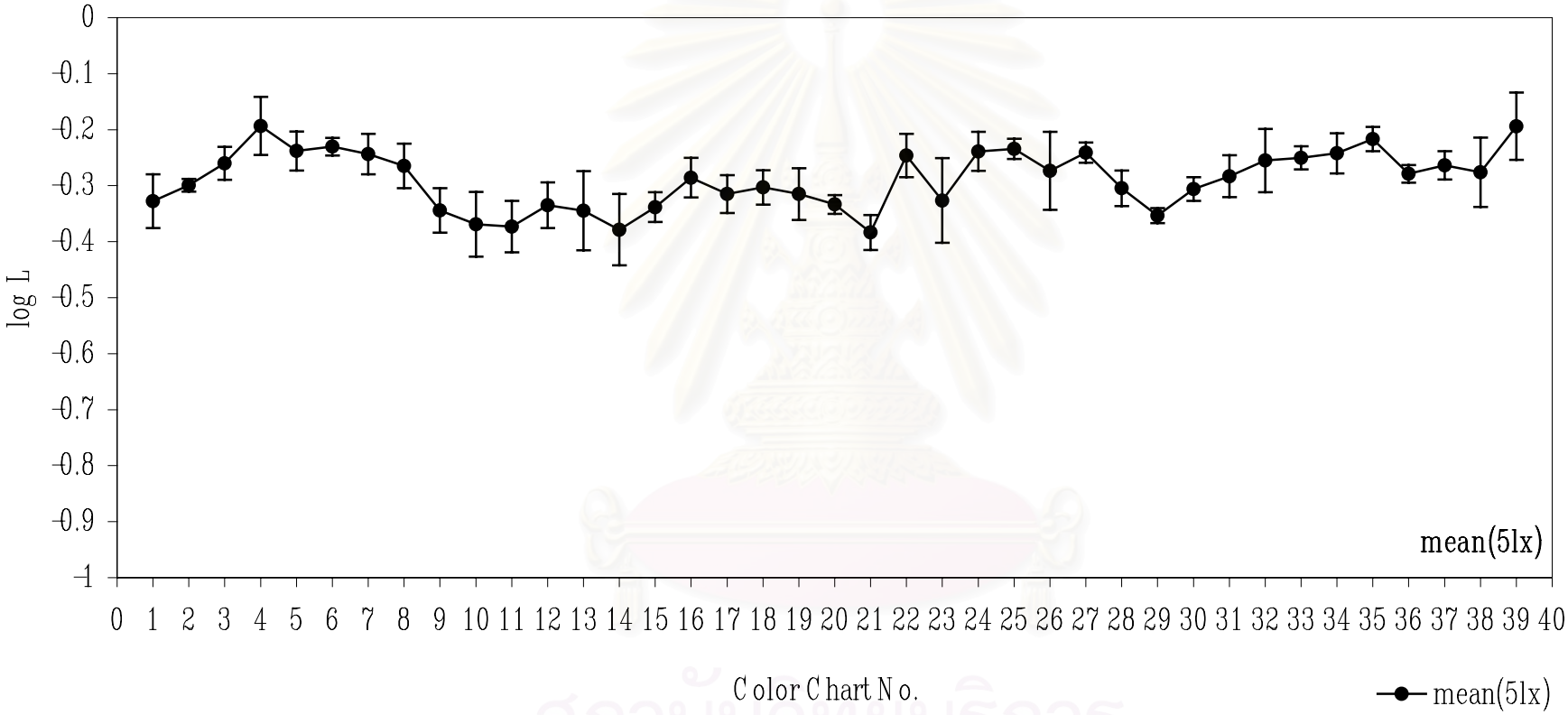


Fig. 4-8a The average results of the border of RVSI and their the standard deviation of the variation calculated from the data four subjects for 5lux.

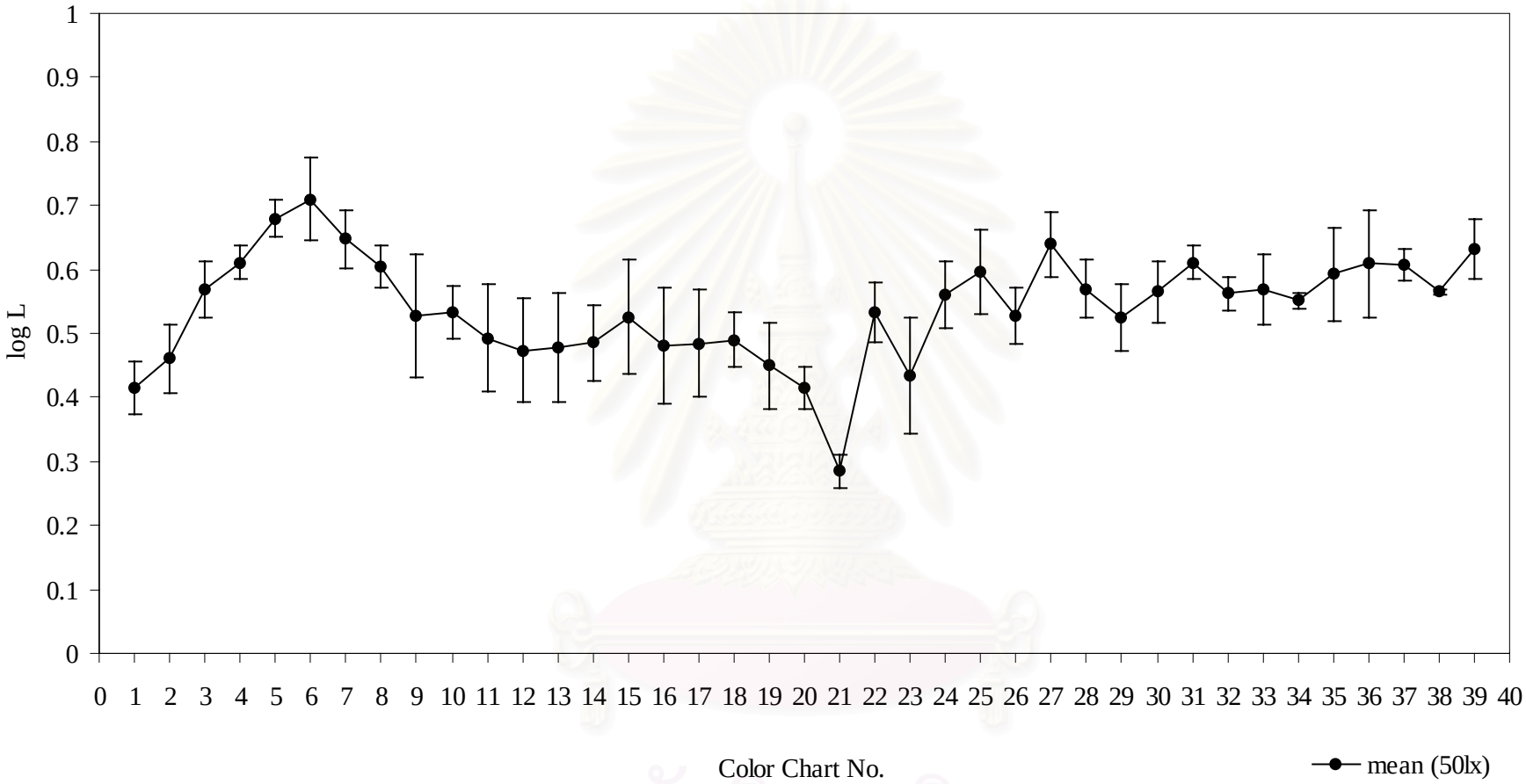


Fig. 4-8b The average results of the border of RVSI and their the standard deviation of the variation calculated from the data four subjects for 50lux.

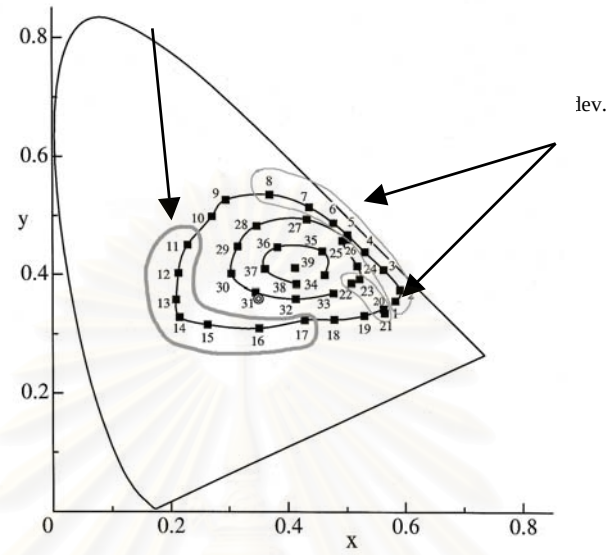


Fig. 4-9 The standard deviation of the test chart ranges are mentioned above in the chromaticity diagram.

We obtained for 39 different color charts their border luminance at 5 lux and 50 lux. This data can be referred to when we like to know the border luminance at these two illuminance levels should such need occur. It would be very useful if we can predict the border luminance for any other illuminance levels. The average border luminance of the 39 color charts was –0.2887 in log units in cd/m^2 at 5 lux and it was 0.5400 at 50 lux. The luminance at 50 lux was not 10 times the luminance at 5 lux to the contrary it begins as a non- linear function and becomes a linear. But if we can assume that the border luminance has a linear relation to the illuminance of a space in the logarithmic scale and that the two curves have the same shape, we have the following equation,

$$\text{Log } L_B = 0.8287 \log E + K_C \qquad (4\text{-}1)$$

L_B denotes the border luminance in cd/m^2 ,

E the illuminance in the space

K_C the color factor for each color chart.

Here the illuminance E must be measured on a table at a height of 126 cm from the floor. Obtained values K_C based on the mean results given in Table 4-1 are shown in Table 4-3.

Table 4-3 The values K_c obtained based on the mean result given from the mean data of the border of RVSI for 50lux

No.	HVC	BD-50		No.	HVC	BD-50	
		cd/m2	Kc			cd/m2	Kc
1	5R4/10	0.415	-0.703	21	5YR5/6	0.28459	-0.924
2	10R4/10	0.460	-0.626	22	5R5/6	0.53329	-0.502
3	5YR5/10	0.568	-0.443	23	5R5/3	0.43393	-0.671
4	10YR5/10	0.611	-0.370	24	5RP5/6	0.5613	-0.454
5	5Y7/10	0.680	-0.253	25	5P5/6	0.59576	-0.396
6	10Y7/10	0.709	-0.203	26	5P5/3	0.527	-0.513
7	5GY6/9	0.647	-0.309	27	5PB5/6	0.63967	-0.321
8	10GY6/10	0.605	-0.380	28	5B5/6	0.56959	-0.440
9	5G5/10	0.527	-0.513	29	5B5/3	0.52412	-0.517
10	10G5/10	0.533	-0.503	30	5BG5/6	0.56457	-0.449
11	5BG4/9	0.493	-0.570	31	5G5/6	0.61071	-0.370
12	10BG4/9	0.474	-0.603	32	5G5/3	0.56242	-0.452
13	5B4/9	0.478	-0.596	33	5GY5/6	0.56822	-0.443
14	10B4/10	0.485	-0.584	34	5Y5/6	0.5519	-0.470
15	5PB4/10	0.526	-0.515	35	5Y5/3	0.59215	-0.402
16	10PB4/10	0.482	-0.589	36	10R3/4	0.60978	-0.372
17	5P4/10	0.484	-0.586	37	5Y4/6	0.60646	-0.378
18	10P4/10	0.490	-0.575	38	10RP3/8	0.56508	-0.448
19	5RP4/10	0.449	-0.645	39	N5	0.6316	-0.335
20	10RP4/10	0.416	-0.701				

4.2 The aperture appearance

The subjective impression for the test charts at the border was different depending on their color. There were individual variations in impressions but in general it can be summarized as follows.

Red test charts: dazzling color

Yellow charts: too bright

Green charts: fluorescent

Blue charts: transparent

4.3 The Brightness Matching

The brightness matching of the test charts was done for a white reference of N7. It is the heterochromatic brightness matching, that is the brightness matching between a colored test chart and an achromatic reference chart of N7. Because of the color difference the matching was not easy in the border case.

The data from all four subjects are shown in Fig.4–10 to Fig. 4-13, respectively as in the case of the border experiment. Their mean is plotted in Fig. 4-14 and the data in Table 4-3. In the figure (a) the data for the room illuminance 5 lux are shown and in the figure (b) the data for 50 lux is shown. Along the abscissa, the test chart number is taken according to Table 3-1, and along the ordinate the luminance of the test charts at the brightness matching is taken in cd/m^2 in logarithmic units. Each point represents the average of ten determinations and vertical lines the standard deviations.

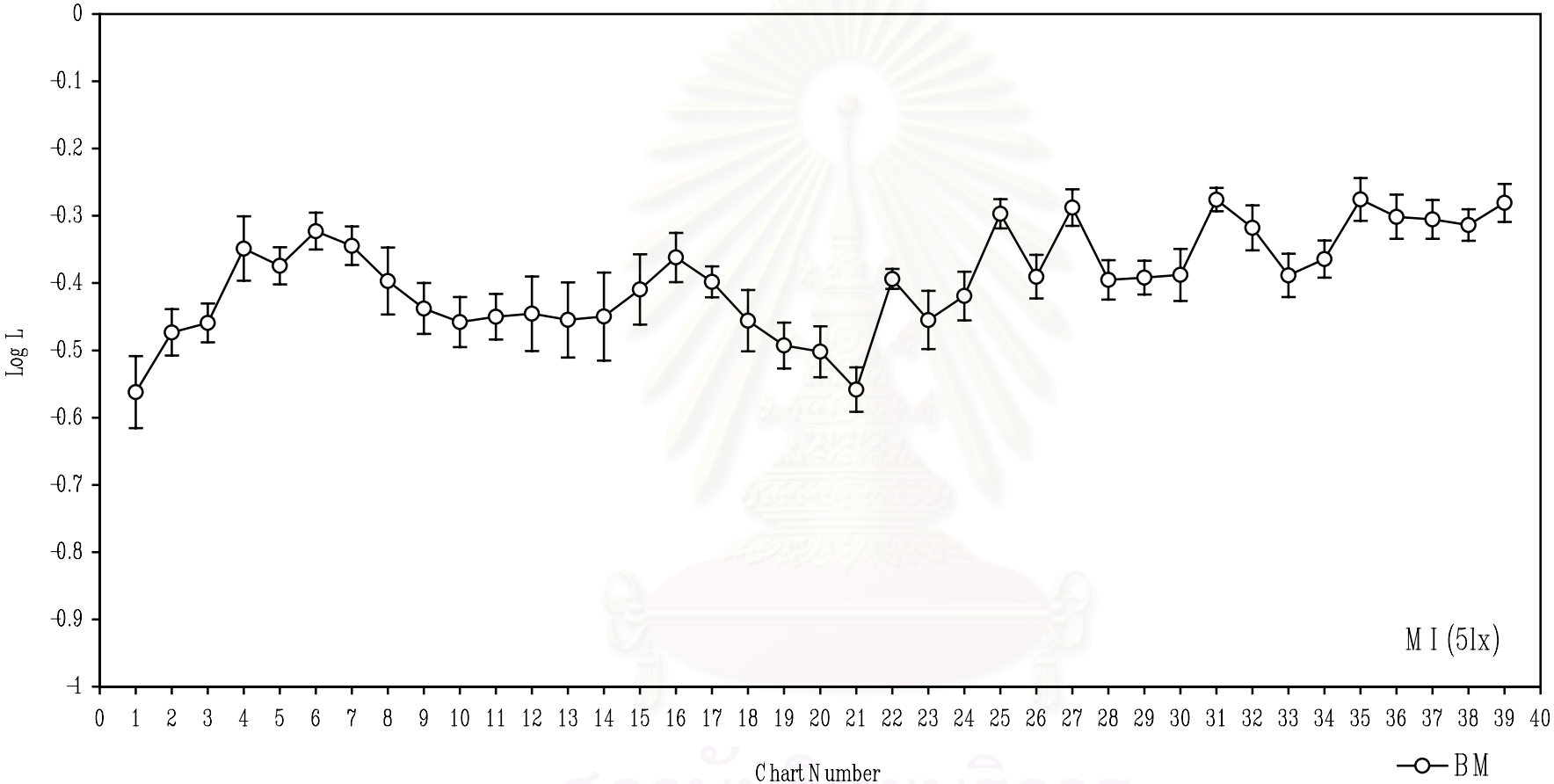


Fig.4-10a Result of the brightness matching experiment(BM) from the subject MI for 5lux.

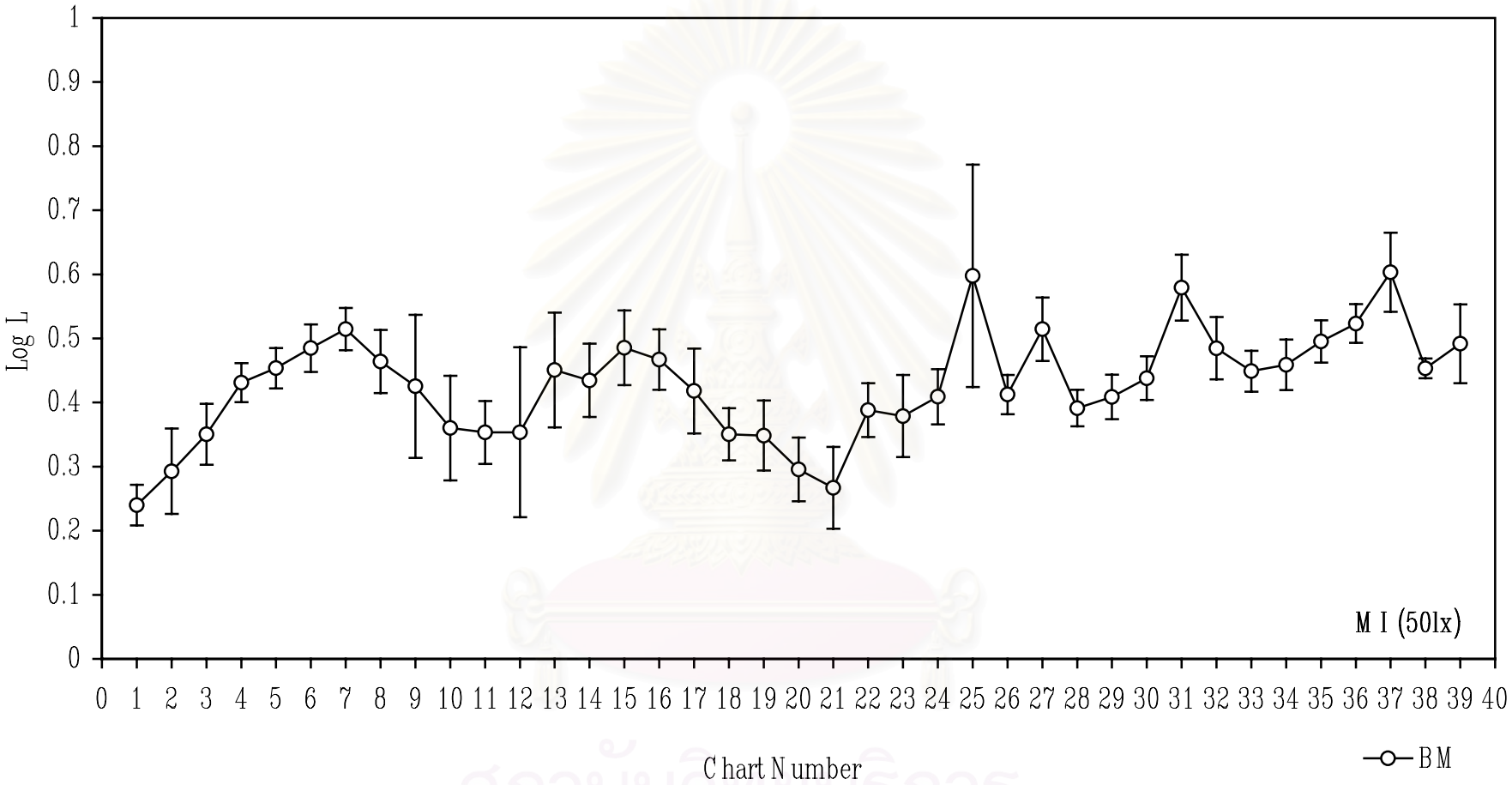


Fig.4-10b Result of the brightness matching experiment(BM) from the subject MI for 50lux.

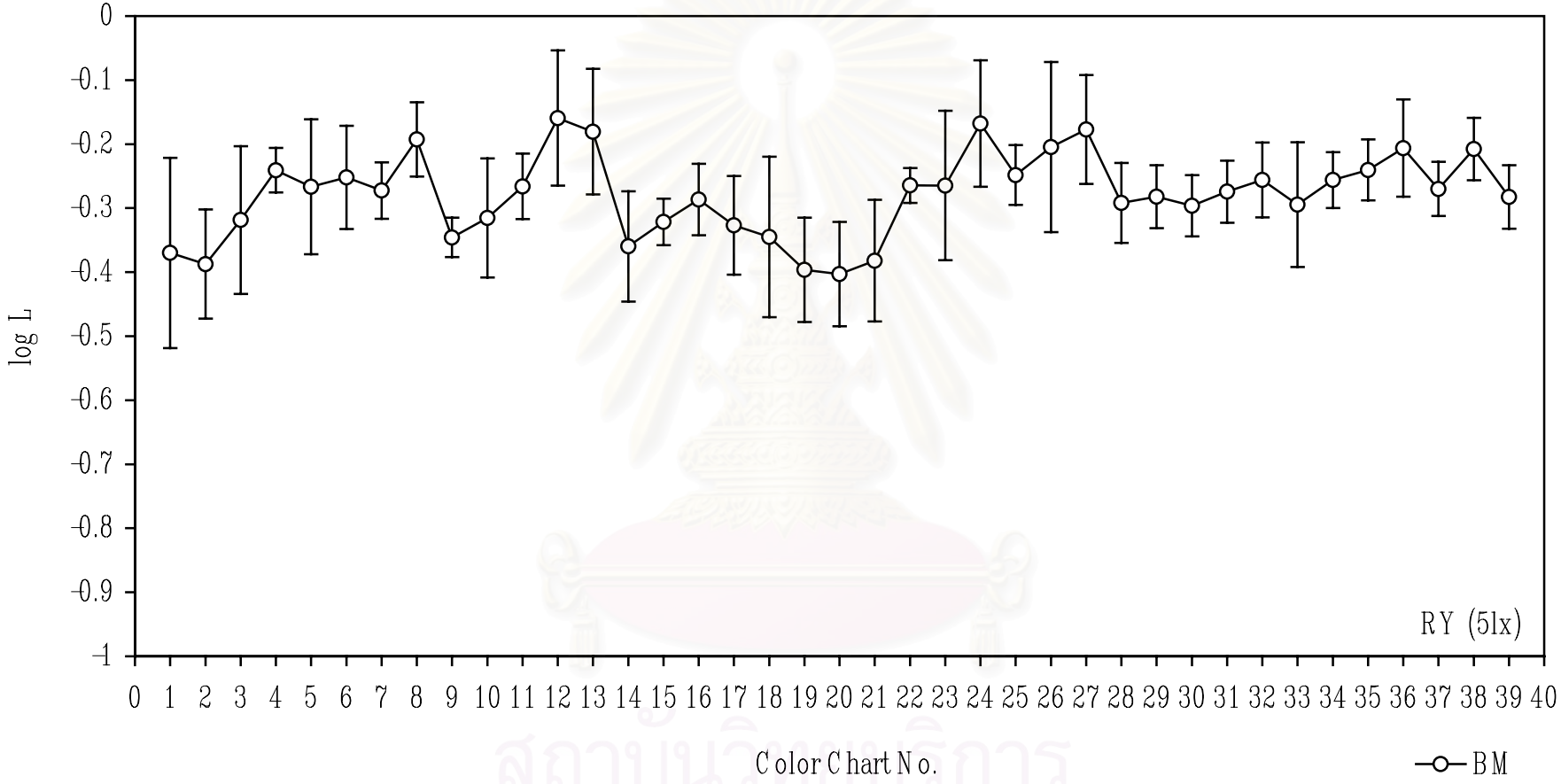


Fig.4-11a Result of the brightness matching experiment(BM) from the subject RY for 5lux.

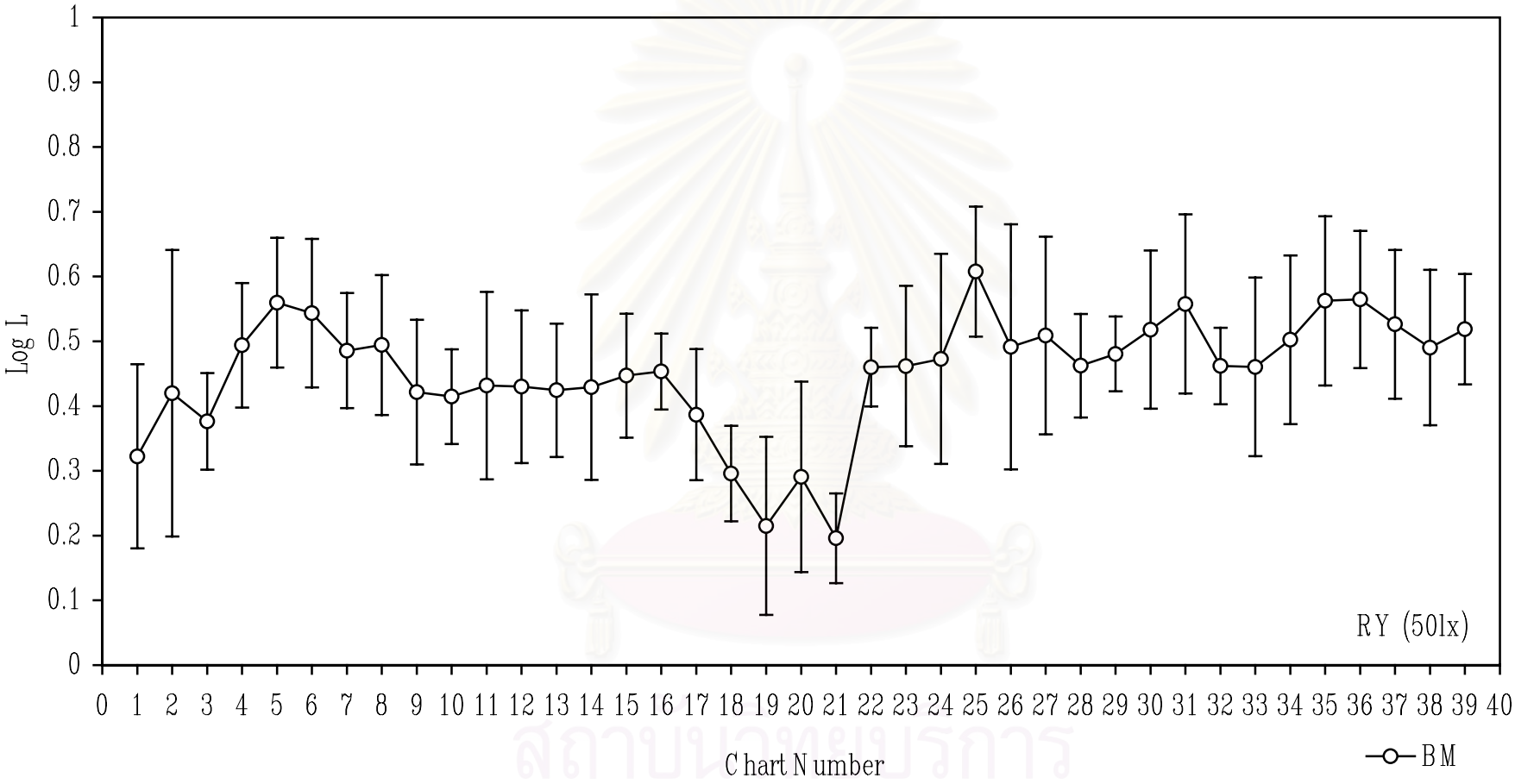


Fig.4-11b Result of the brightness matching experiment(BM) from the subject RY for 50lux.

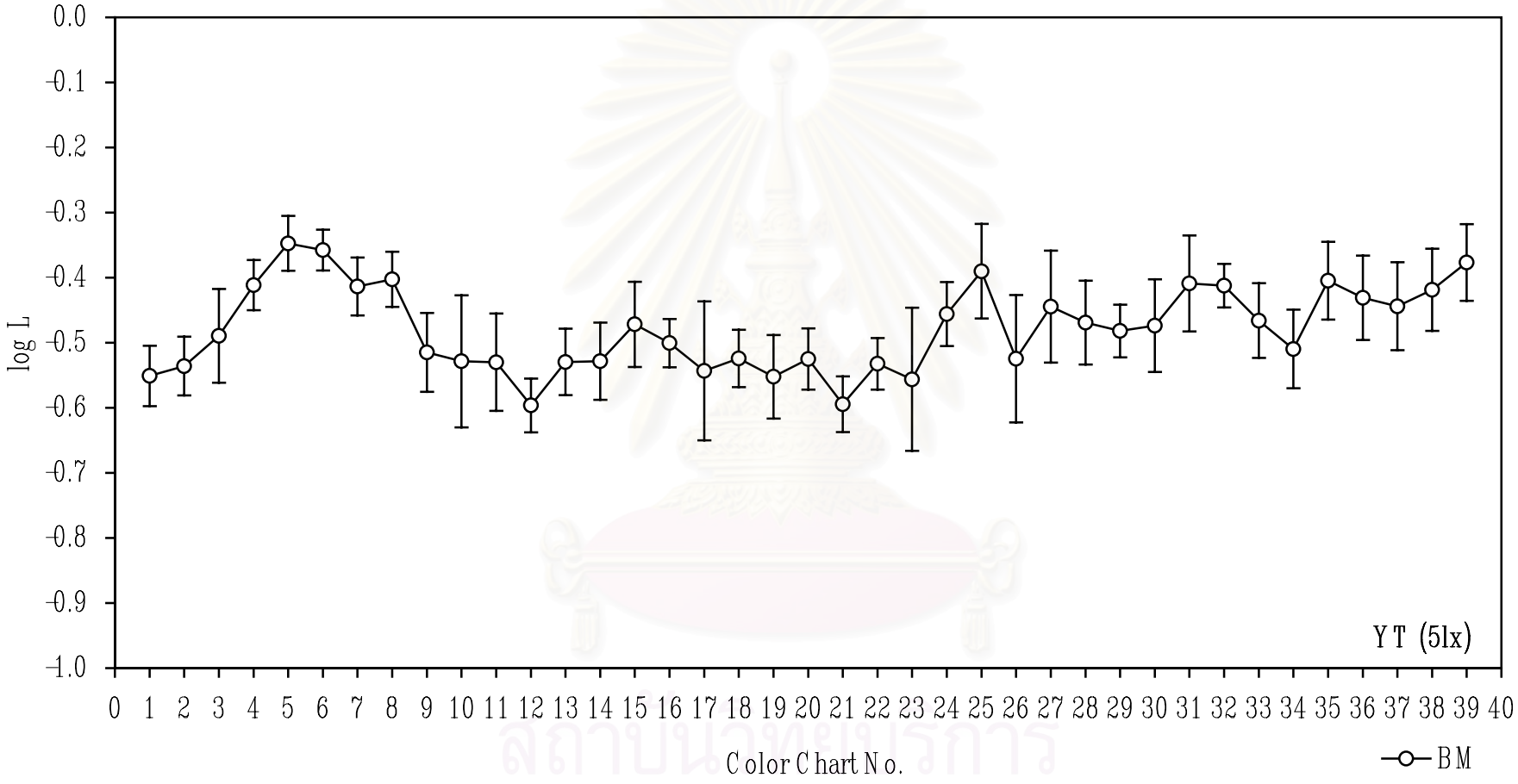


Fig.4-12a Result of the brightness matching experiment(BM) from the subject YT for 5lux**.**

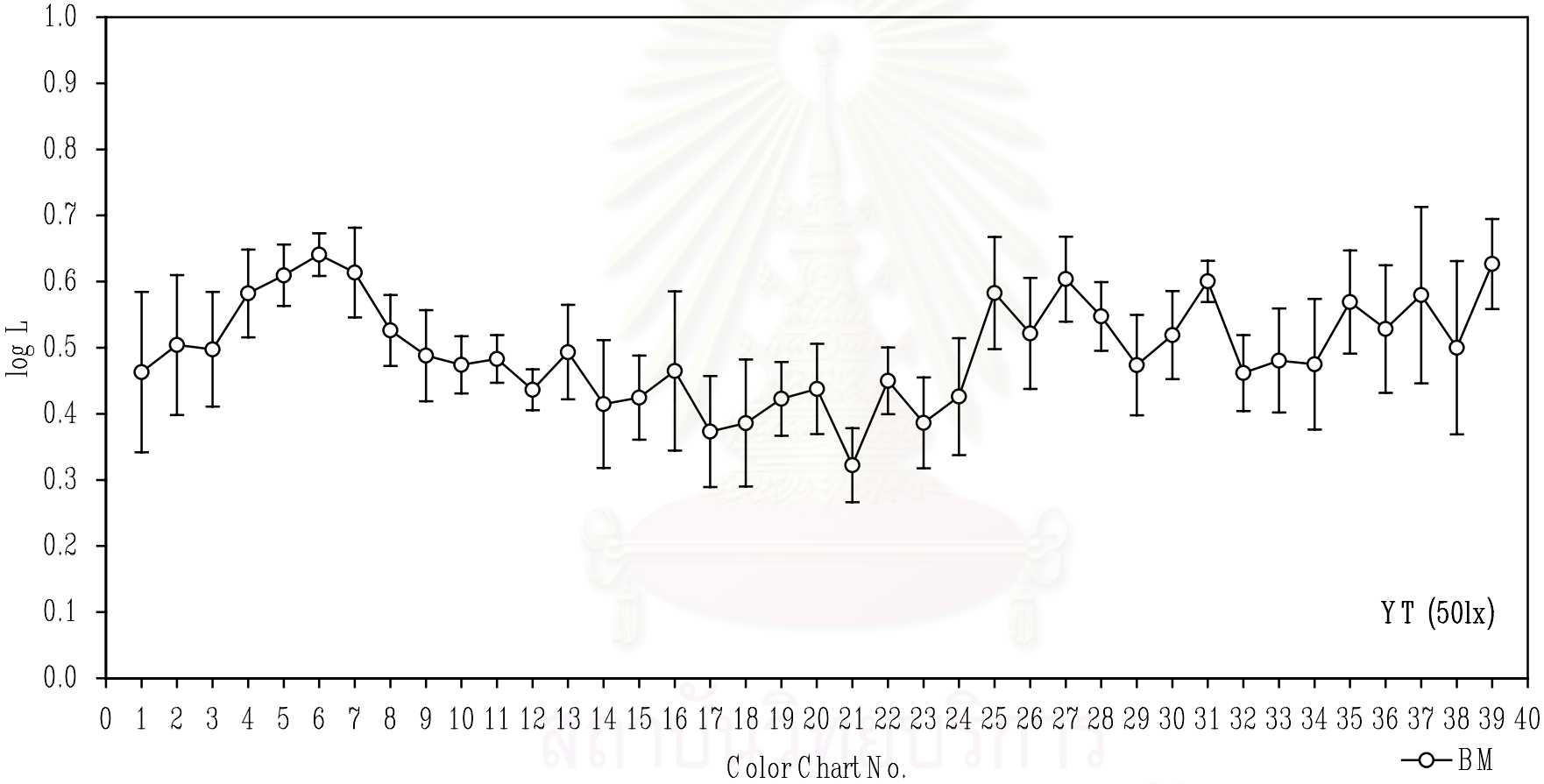


Fig.4-12b Result of the brightness matching experiment(BM) from the subject YT for 50lux.

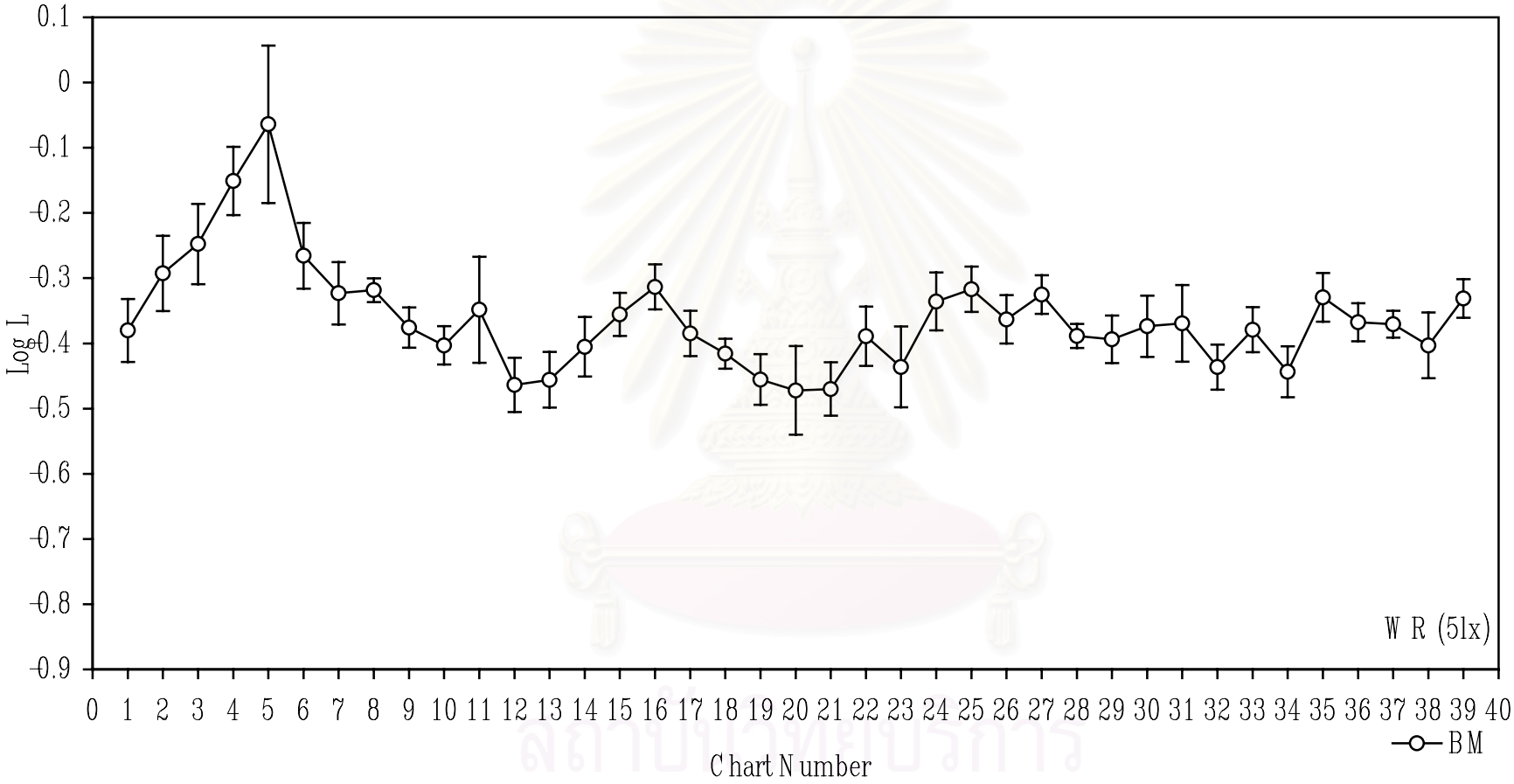


Fig.13a Result of the brightness matching experiment(BM) from the subject WR for 5lux.

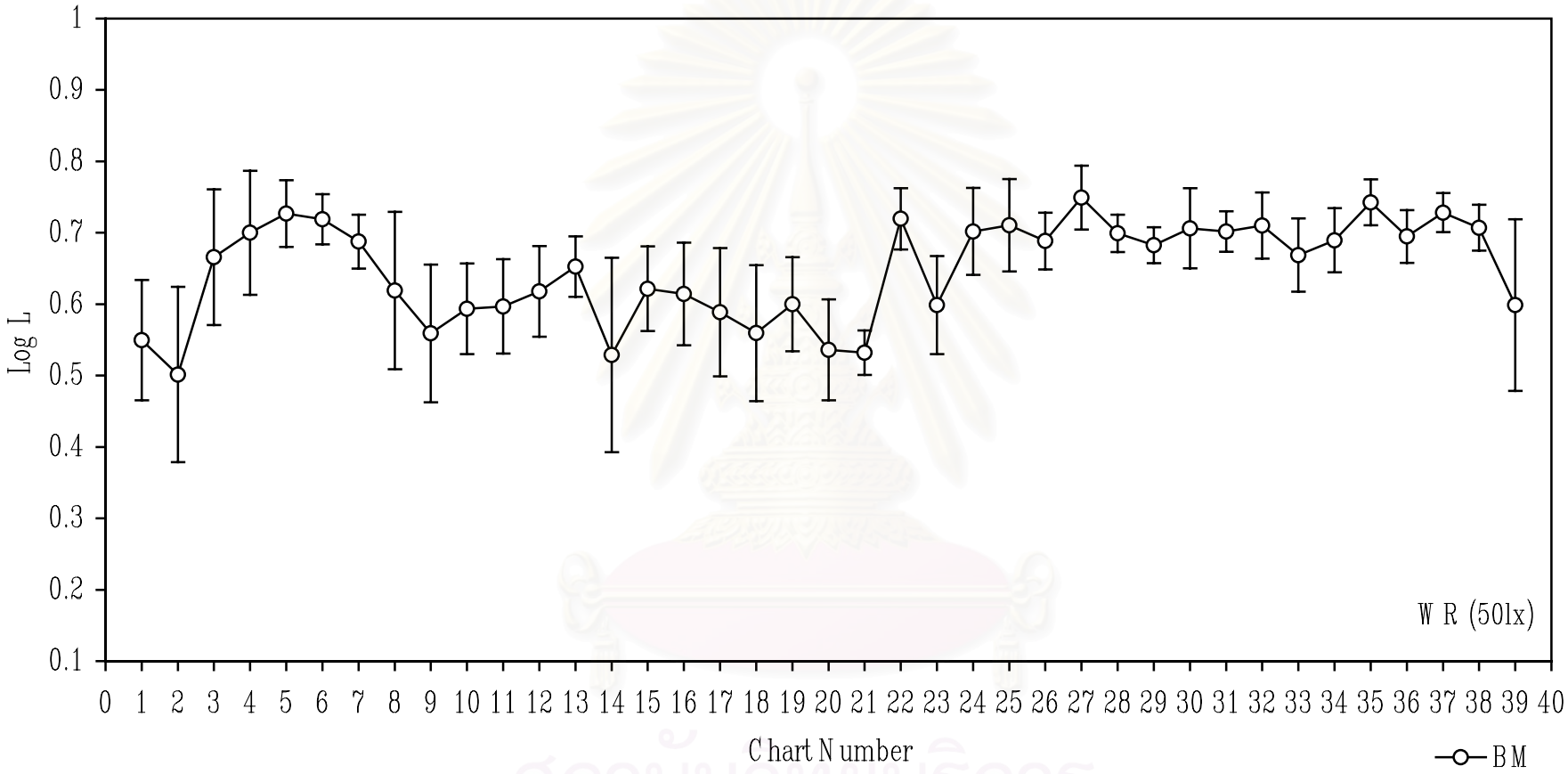


Fig.13b Result of the brightness matching experiment(BM) from the subject WR for 50lux.

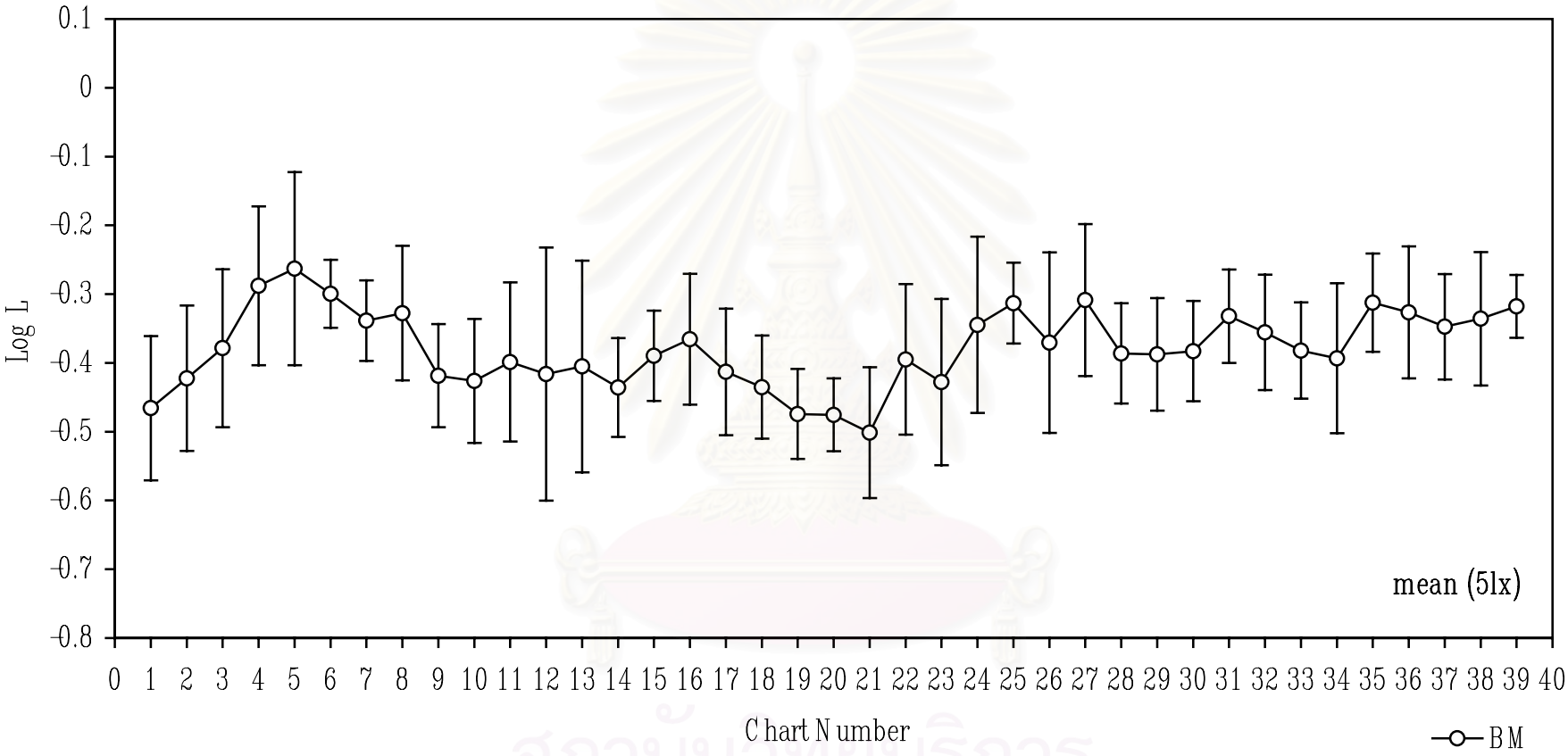


Fig.4-14a Result of the brightness matching experiment(BM) from mean of 5 subjects for 5lux.

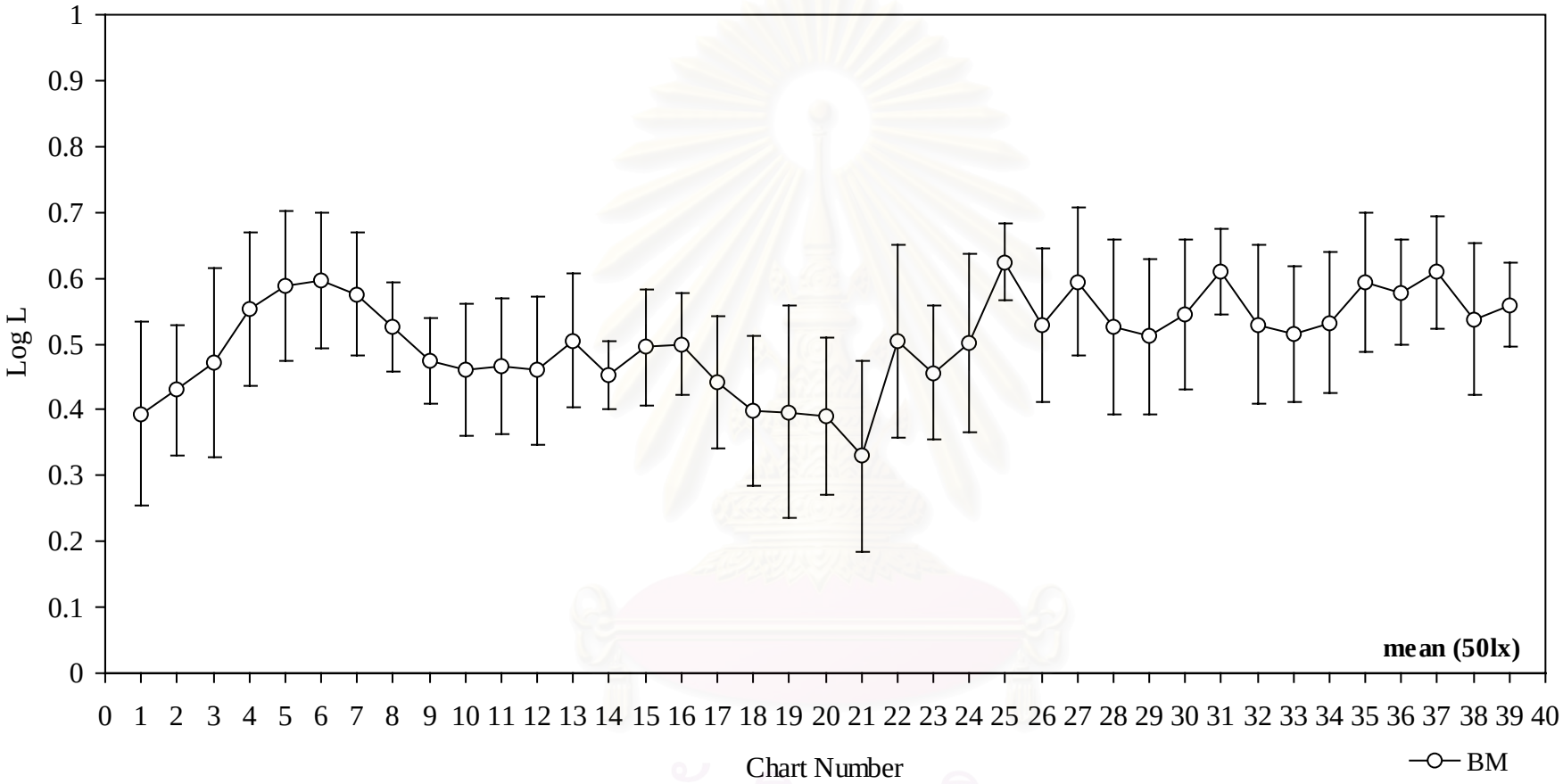


Fig.4-14b Result of the brightness matching experiment(BM) from mean of 5 subjects for 50lux.

As in the case of the border experiment the matched luminance changed for different test charts. This was expected from the well known fact of the Helmholtz-Kohlrausch (appendix G) effect, which says that a colored chart appears brighter when it is compared to the achromatic chart with the same lightness. All the curves showed similar shapes with the corresponding curves of the border experiment. This suggests that the border of RVSI is determined by the brightness of the test charts. We will discuss this later.

The standard deviation of all the subjects is shown in Table 4-4 and is similar to that of the border in size. It is similarly larger for 50 lux compared to 5 lux which implies that it was easier for subjects in general to do the heterochromatic brightness matching in a darker room, where the colorfulness of the test charts was smaller compared to the bright room of 50 lux.

Table 4-4 Standard deviation of ten determinations for brightness matching in luminance cd/m^2.

Subject	5 lux	50 lux
MI	0.04	0.06
RY	0.08	0.12
YT	0.06	0.07
WR	0.05	0.06

To see the individual difference the results from the four subjects was plotted together in Fig. 4-15. There is variation among subjects and we did a similar analysis on the data as for the border experiment. Fig. 4-16 is the normalyzed plot and Fig. 4-17 is the mean of all the subjects with the standard deviation calculated from Fig.4-16.

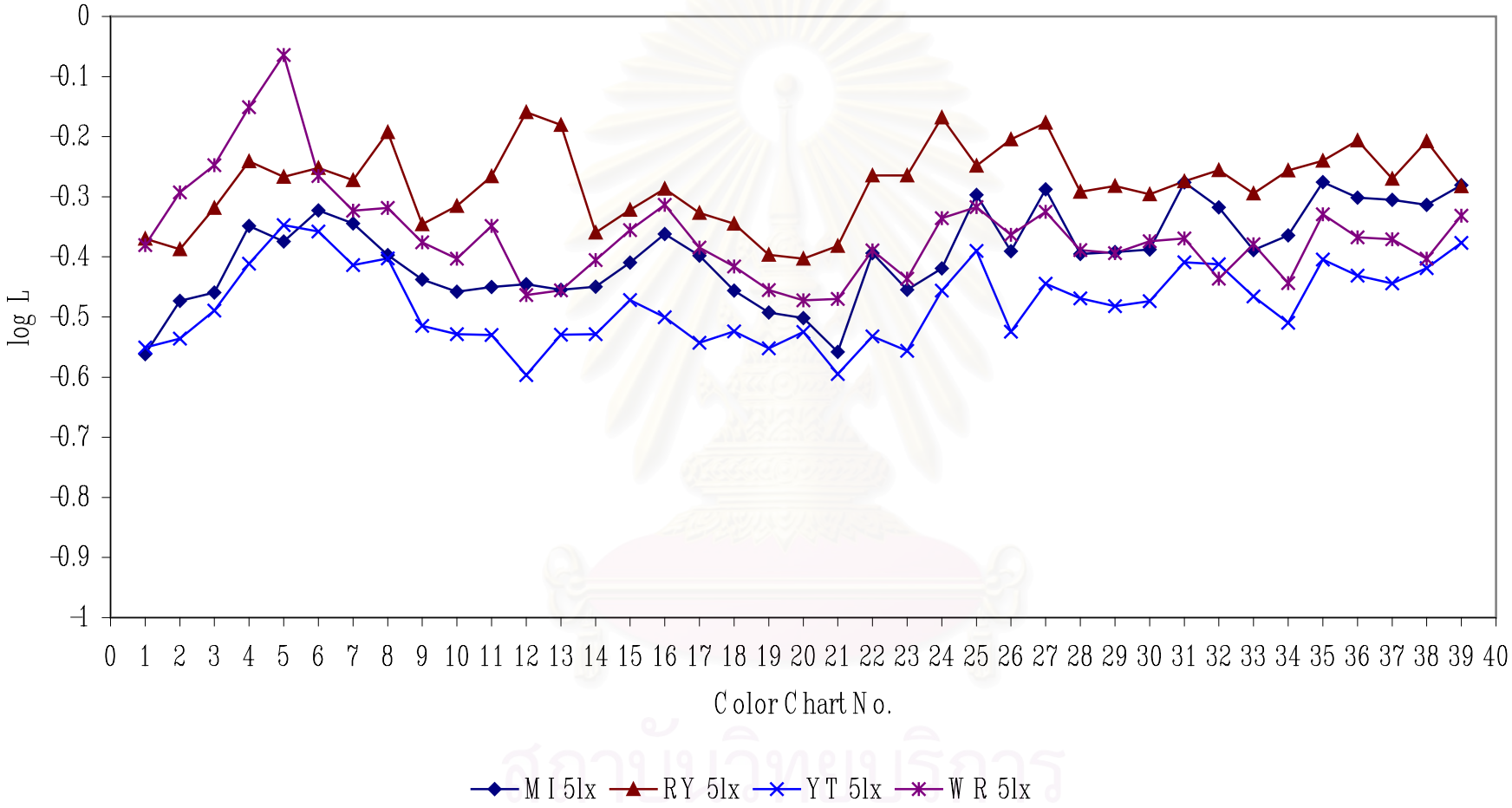


Fig. 4-15a The individual difference the results of the brightness matching data from the four subjects are plotted together for 5lux

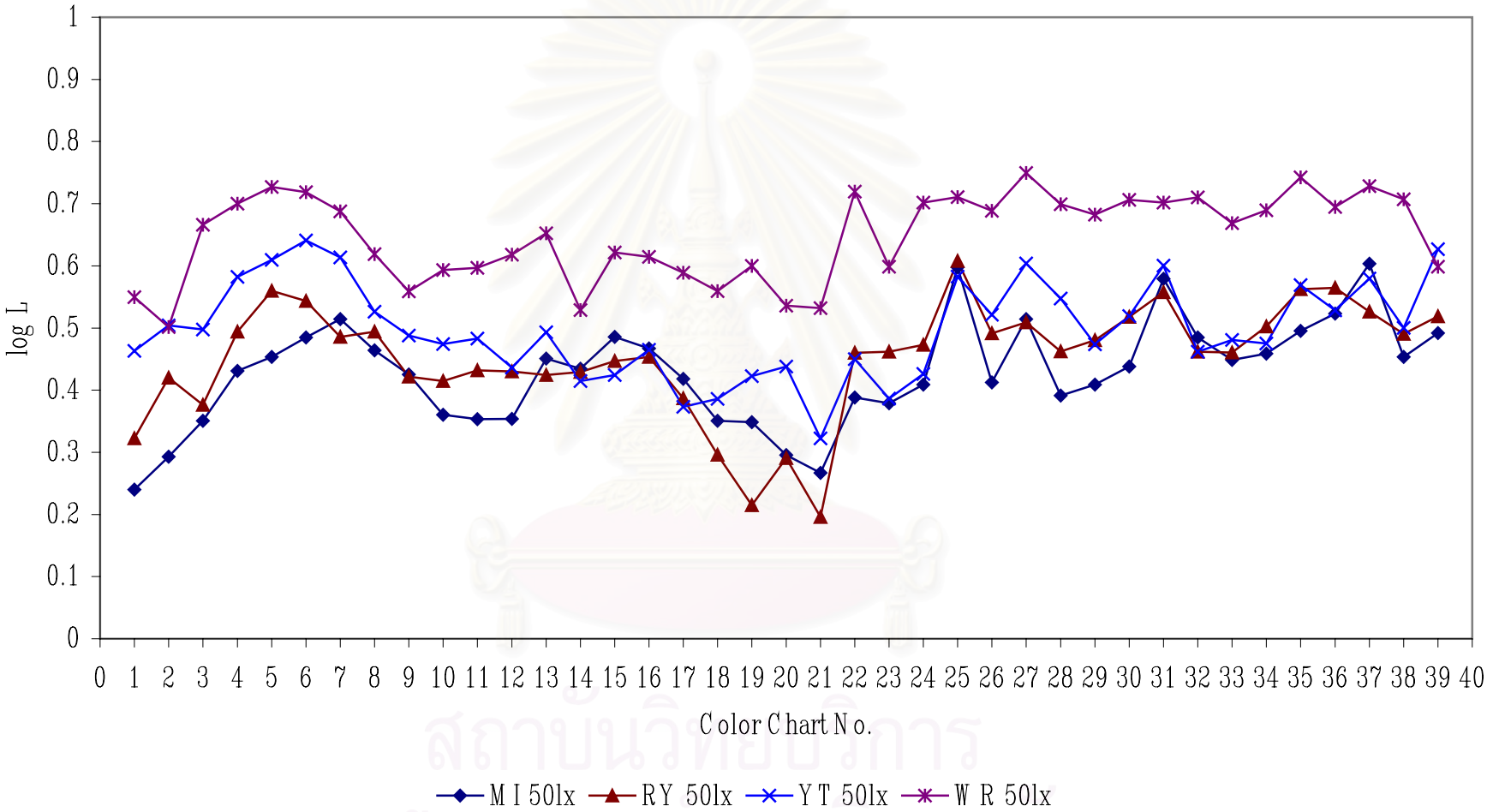


Fig. 4-15b The individual difference the results of the brightness matching data from the four subjects are plotted together for 50lux.

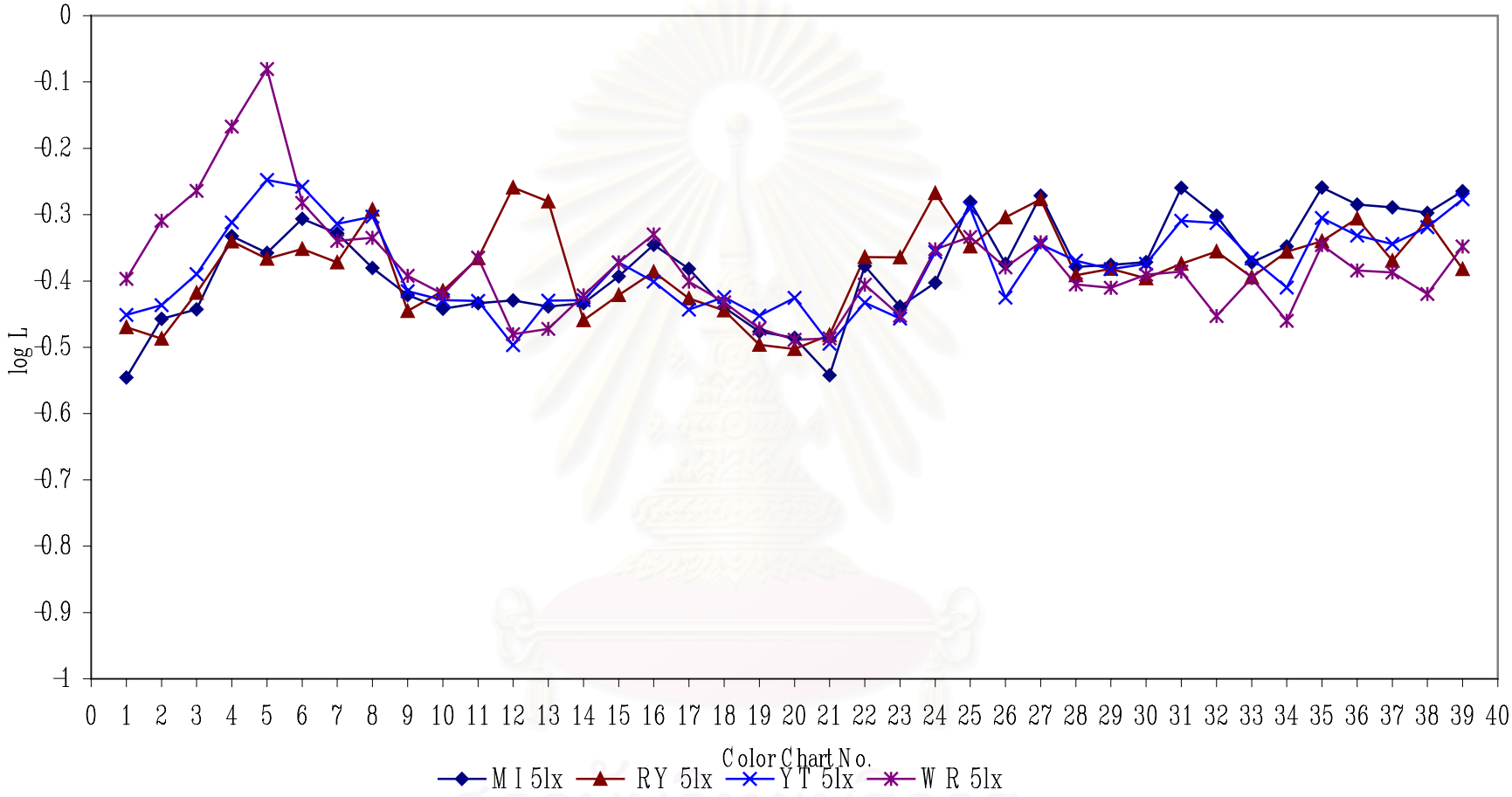


Fig. 4-16a The result of the brightness matching data for each curve was shifted vertically by the average of each subject coincided with total the average for 5 lux.

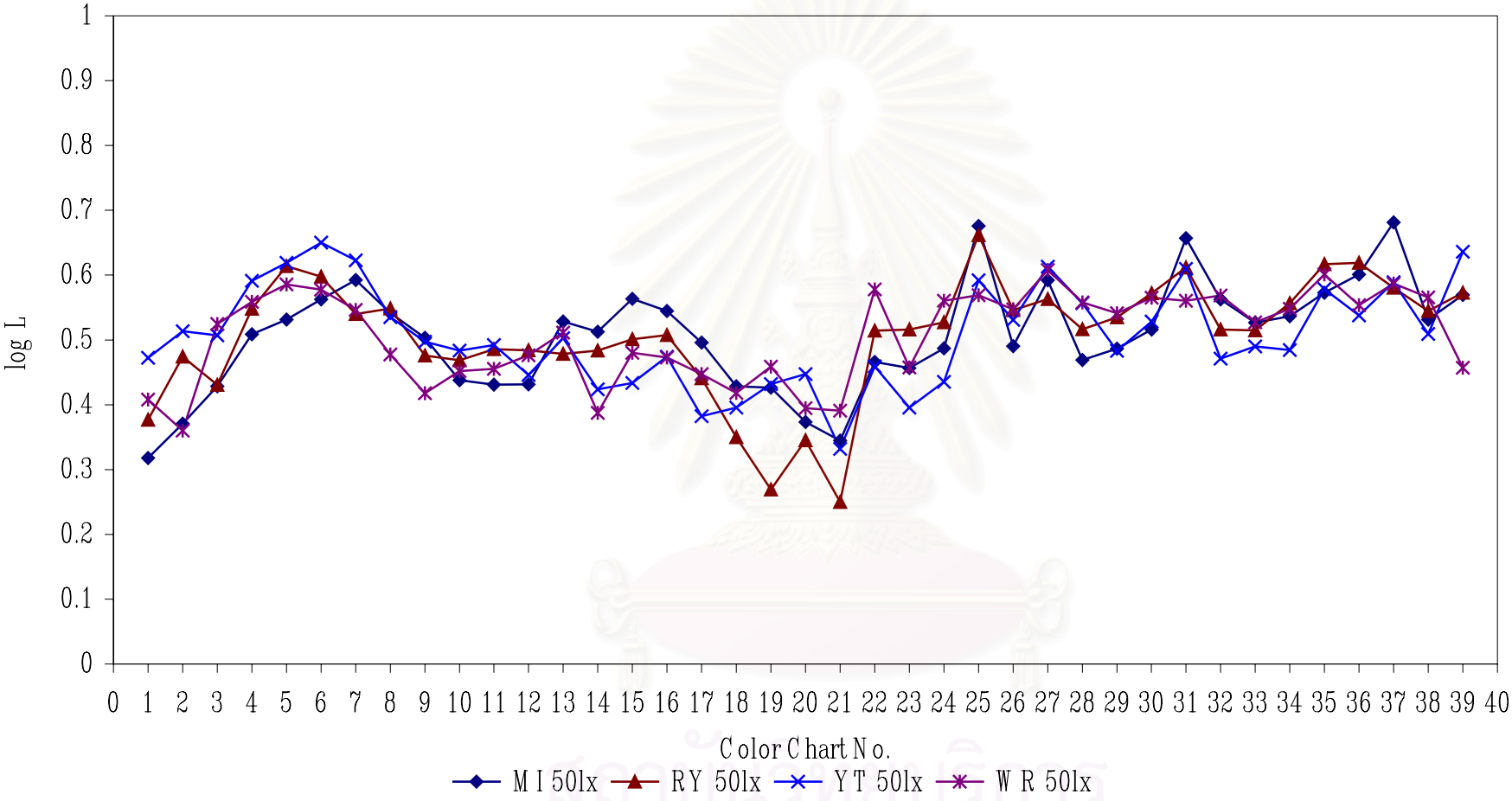


Fig. 4-16b The result of the brightness matching data for each curve was shifted vertically by the average of each subject coincided with total the average for 50 lux.

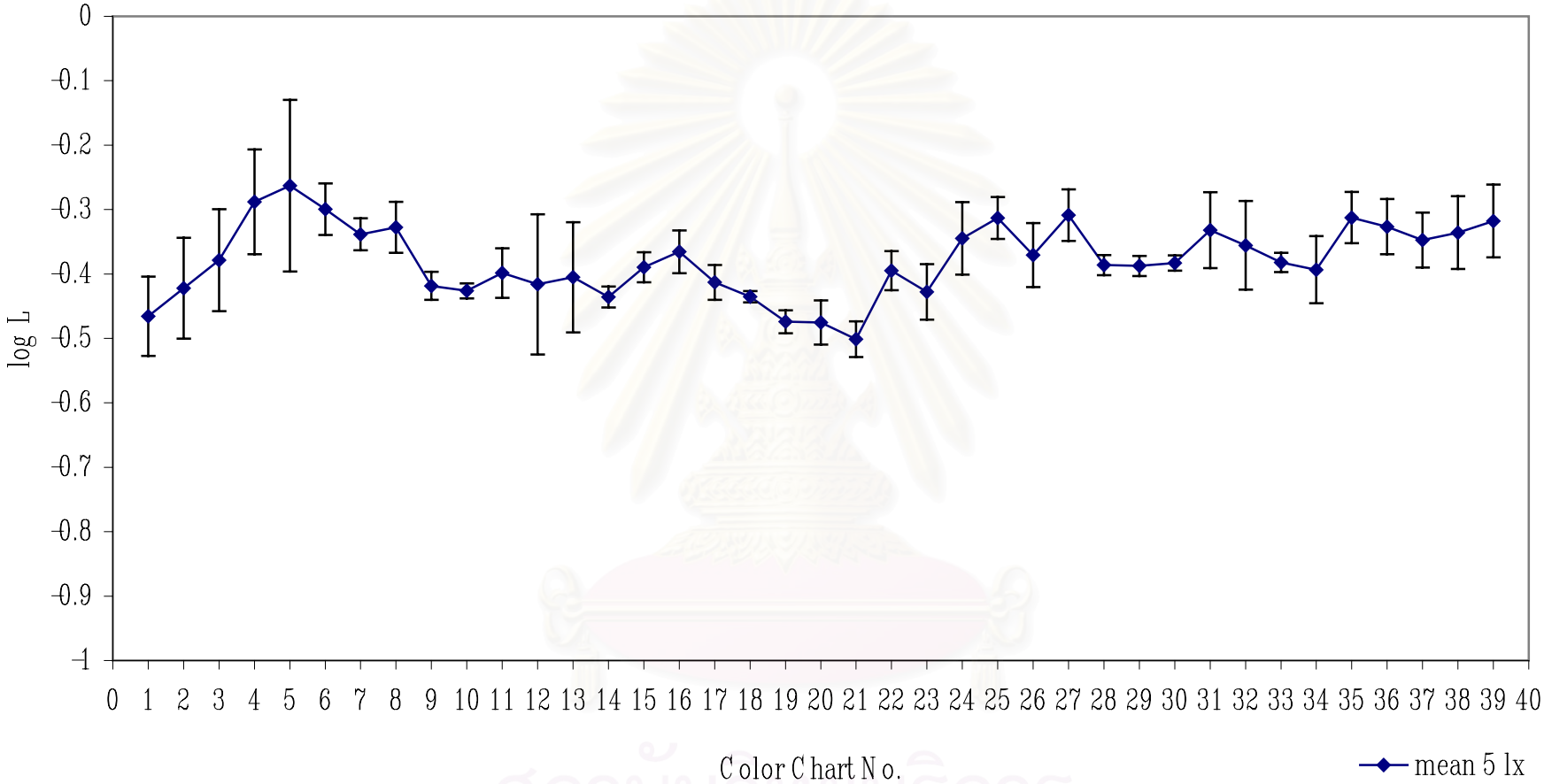


Fig. 4-17a The mean of the brightness matching data of all subjects with the standard deviation for 5lux .

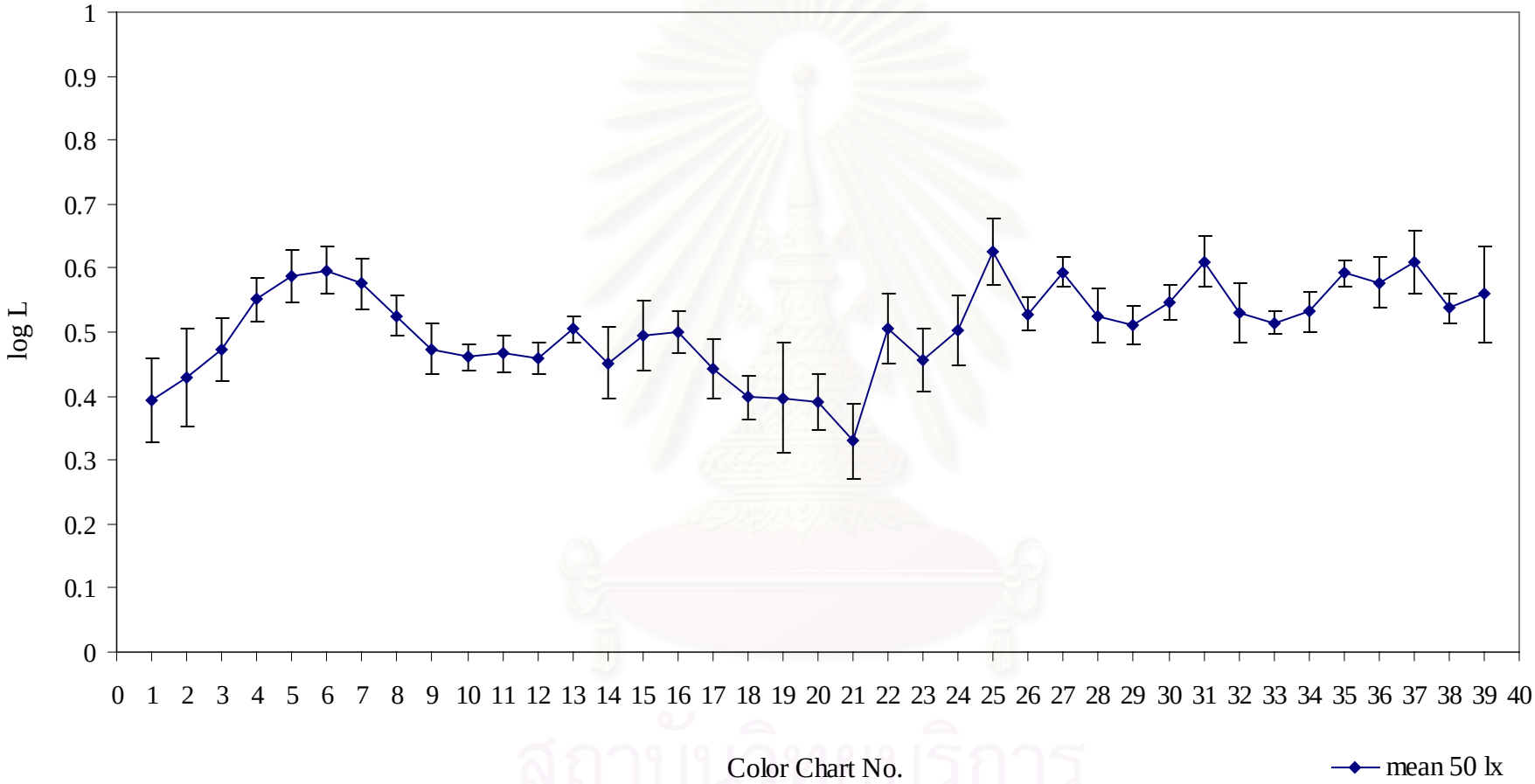


Fig.4-17b The mean of the brightness matching data of all subjects with the standard deviation for 50lux .

The variation among the subjects is small and two curves of 5 and 50 lux agree in shape very well with the exception of the test charts, No. 1 through 5 and 12 and 13 in 5 lux case and No. 1 and 2, and 19 in 50 lux case. These colors are very saturated as seen in Fig. 3-2, despite large distance from the light source located at the ceiling. It is a well known fact that there is a large variation among individuals as for the brightness judgement if the color is very saturated. The large variation found in these figures is therefore expected.

4.4 Comparison between the border and the brightness

The first purpose of this research was to obtain the border luminance of the RVSI so that we can know the luminance limit of a colored object in a room over which it appears luminous or its color becomes a light source color. The second purpose was to investigate the mechanism that determines the border. It was expected that the border would be closely related to the brightness of the object. So we conducted the heterochromatic brightness matching experiment concurrent with the border experiment. Let us now compare the two results;border luminance and the brightness matched luminance.

For the first purpose we tentatively obtained a formula, Eq. (4-1) that relates the room illuminance E to the border luminance LB and the color factor KC. We can use this equation if we need to know the border luminance LB in the same space as the illuminance E.

For the second purpose we compared the border and the brightness of test charts by plotting the results in the same graph as shown in Fig. 4-18 to Fig. 4-21 for

each subject, respectively, and in Fig. 4-22 for the mean. The filled circles in each figure indicate the border luminance. The open circles or luminance after the brightness matching for N7, with a slight vertical shifted so that the average of the brightness matching became equal to the average at border. This was done so that we can compare the shape of the curves clearly by the visual inspection. The two curves agree fairly well for any subjects and for all conditions. We may conclude then that the border is reached whenever the brightness level of a test chart reaches a certain brightness almost equivalent to the brightness of the achromatic chart of N7 as indicated by the agreement of the two luminance curves. To see the agreement precisely we subtracted the brightness luminance from the border luminance. The results are shown by filled triangles in these figures. The difference is almost zero which confirms the above conclusion.

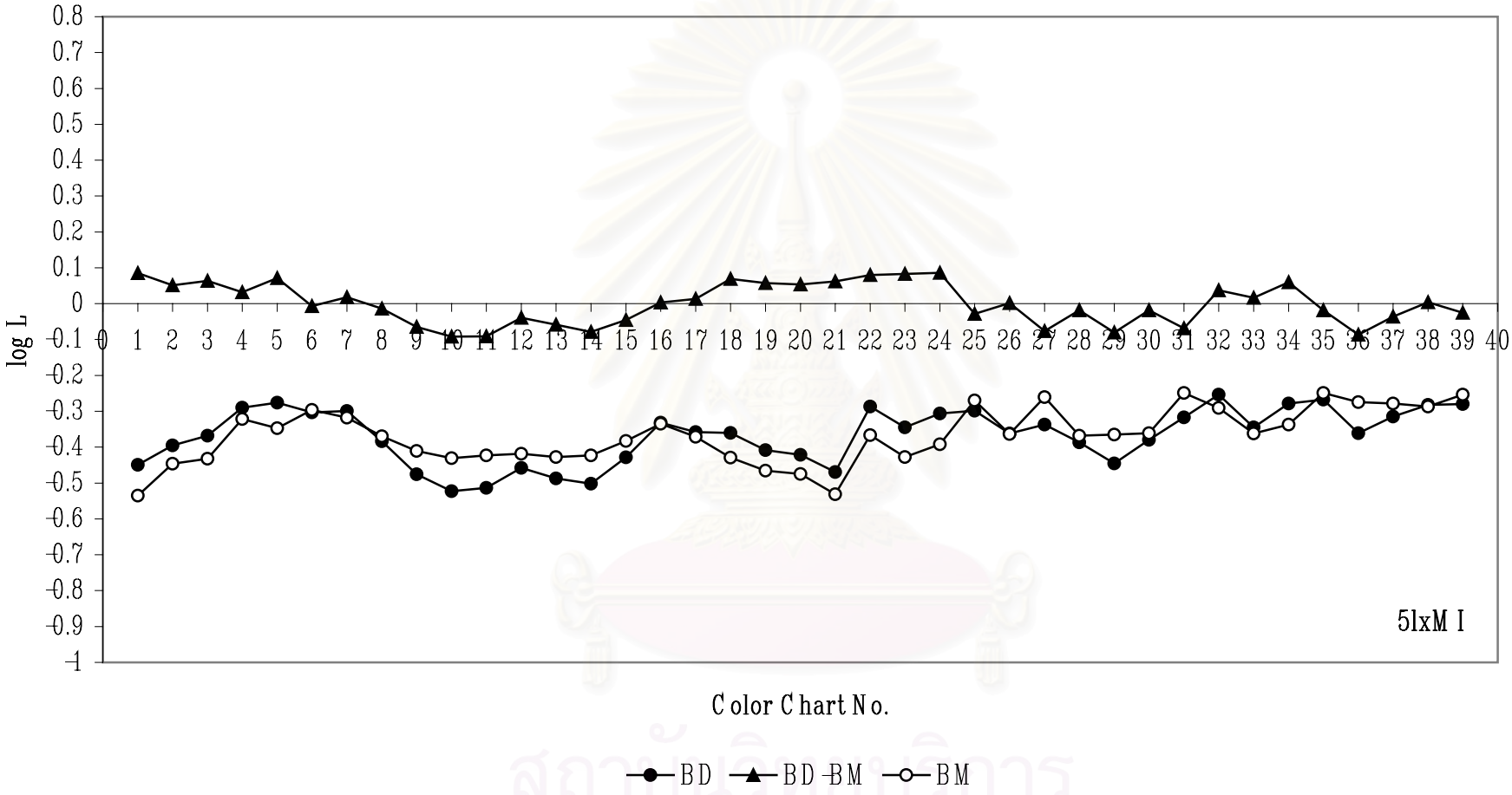


Fig. 4-18a The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject MI, by plotting their results in a same graph for 5lux.

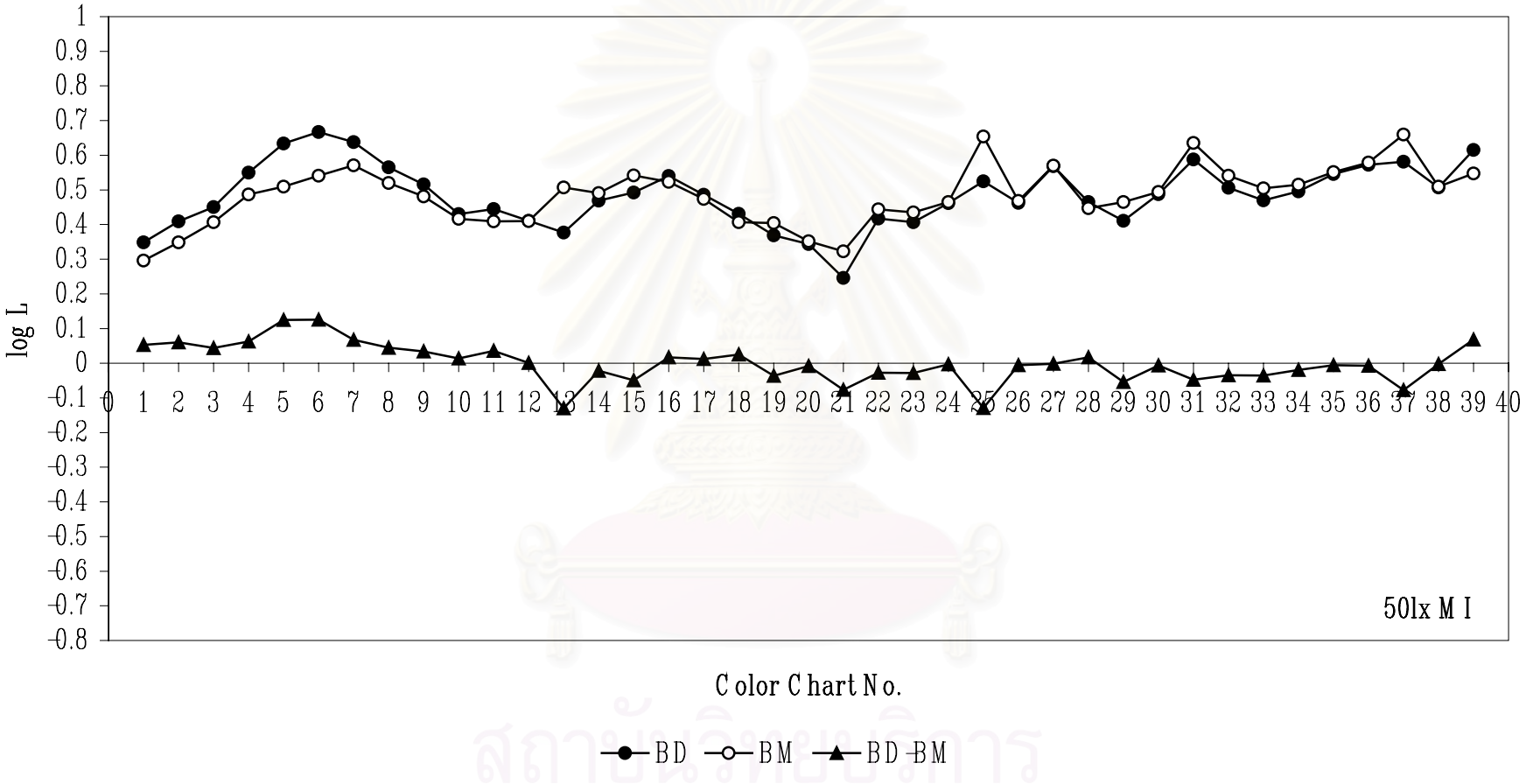


Fig.4-18b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject MI, by plotting their results in a same graph for 50lux.

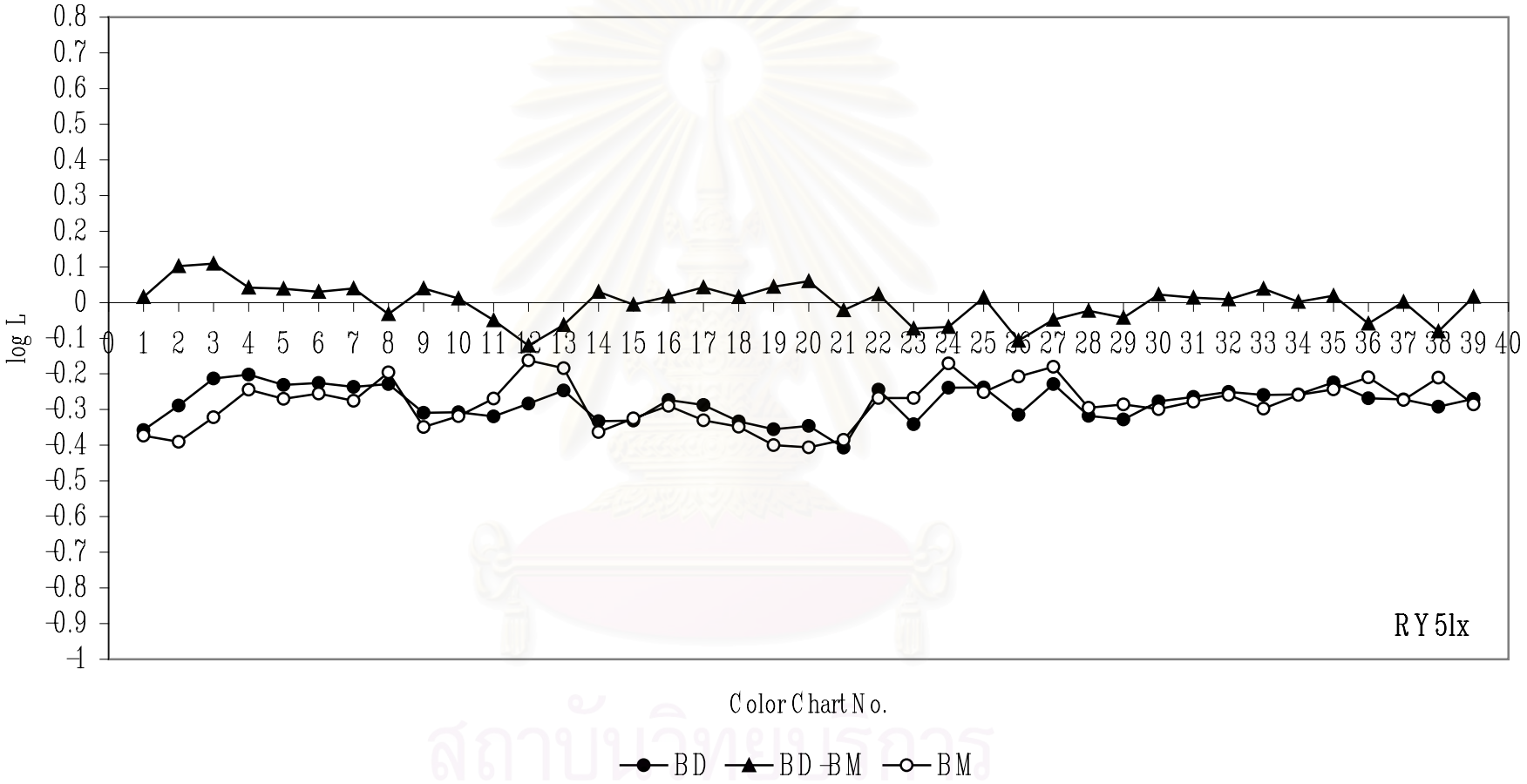


Fig. 4-19a The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject RY, by plotting their results in a same graph for 5lux.

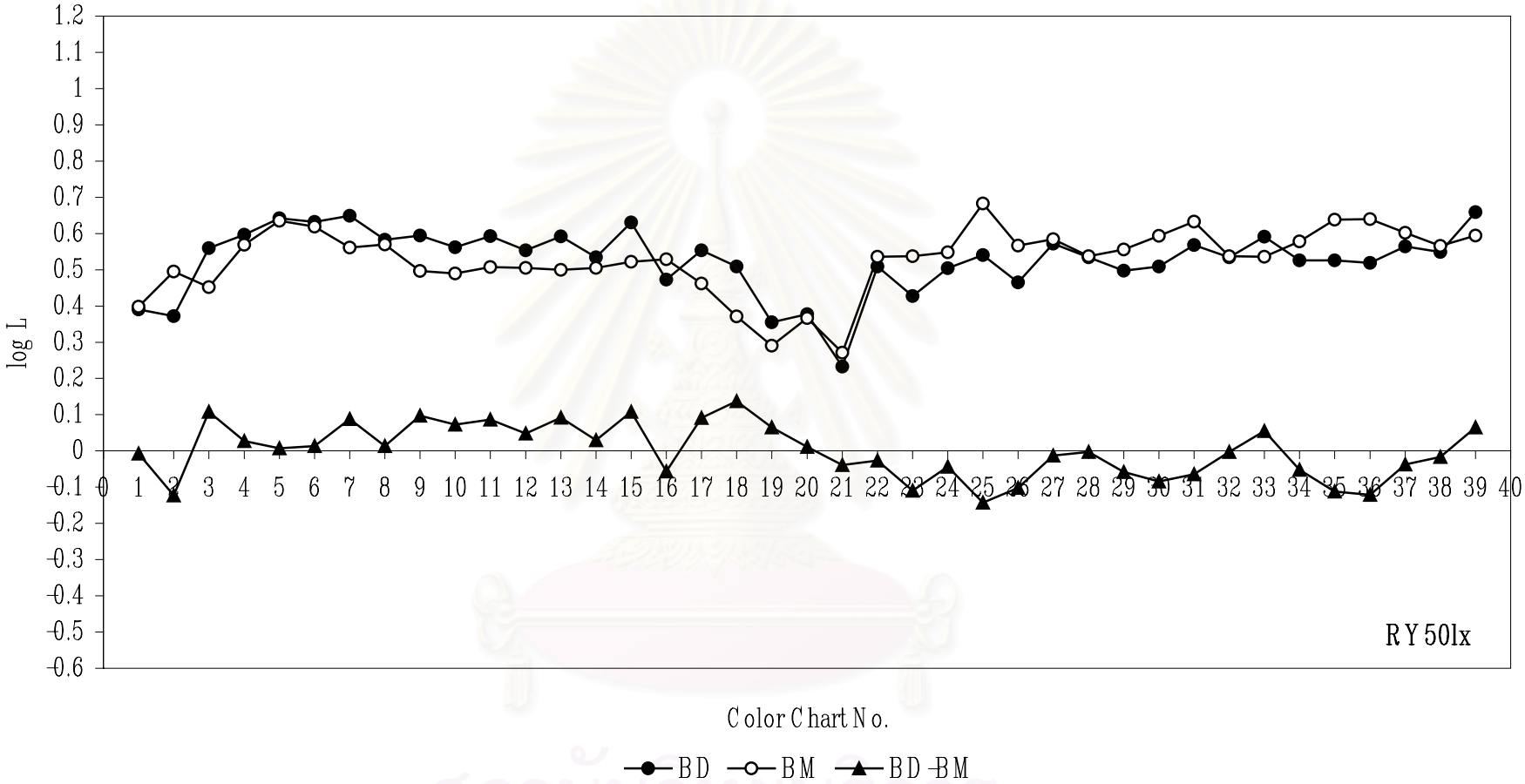


Fig. 4-19b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject RY, by plotting their results in a same graph for 50 lux.

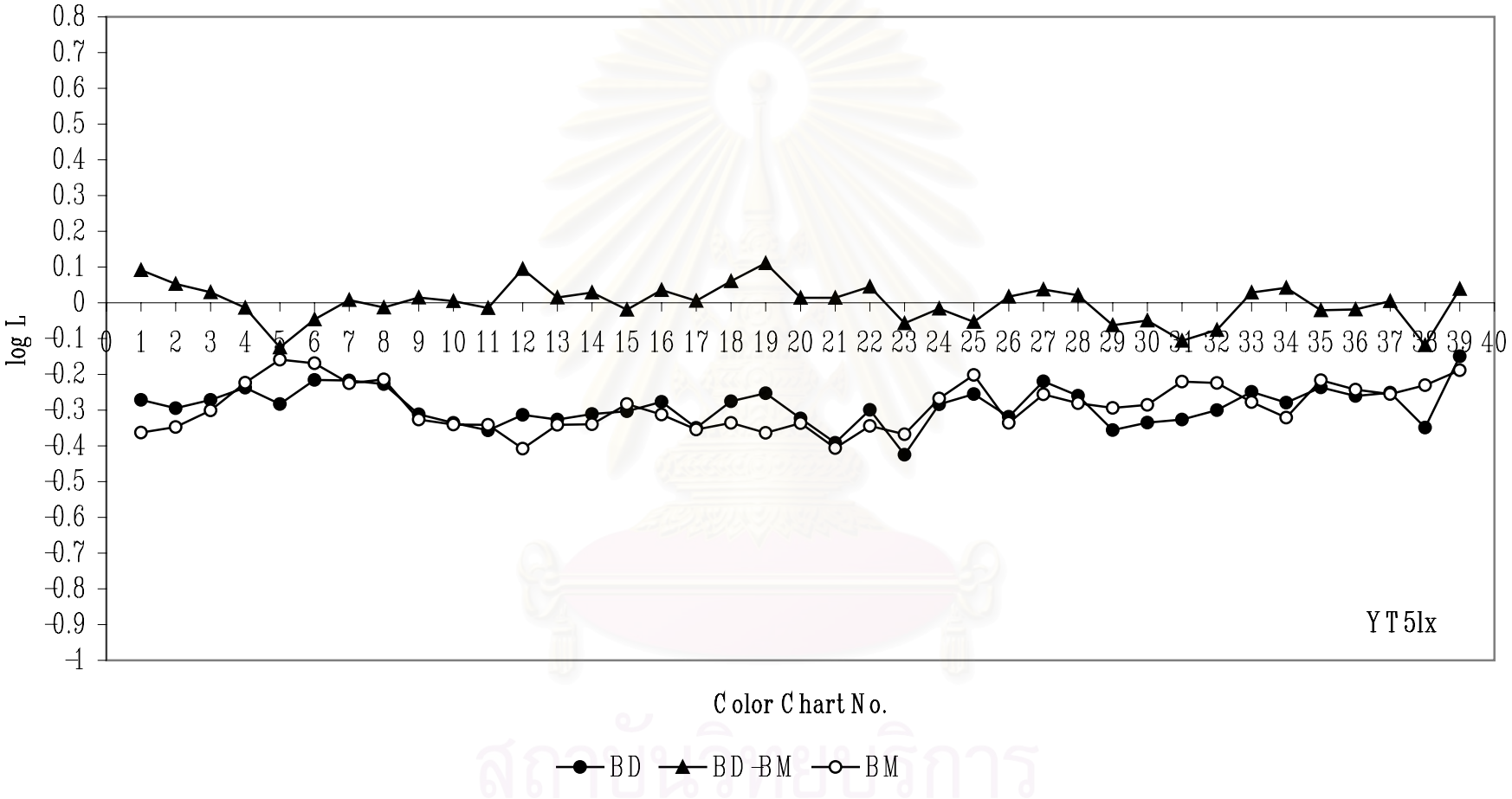


Fig. 4-20a The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject YT, by plotting their results in a same graph for 5lux.

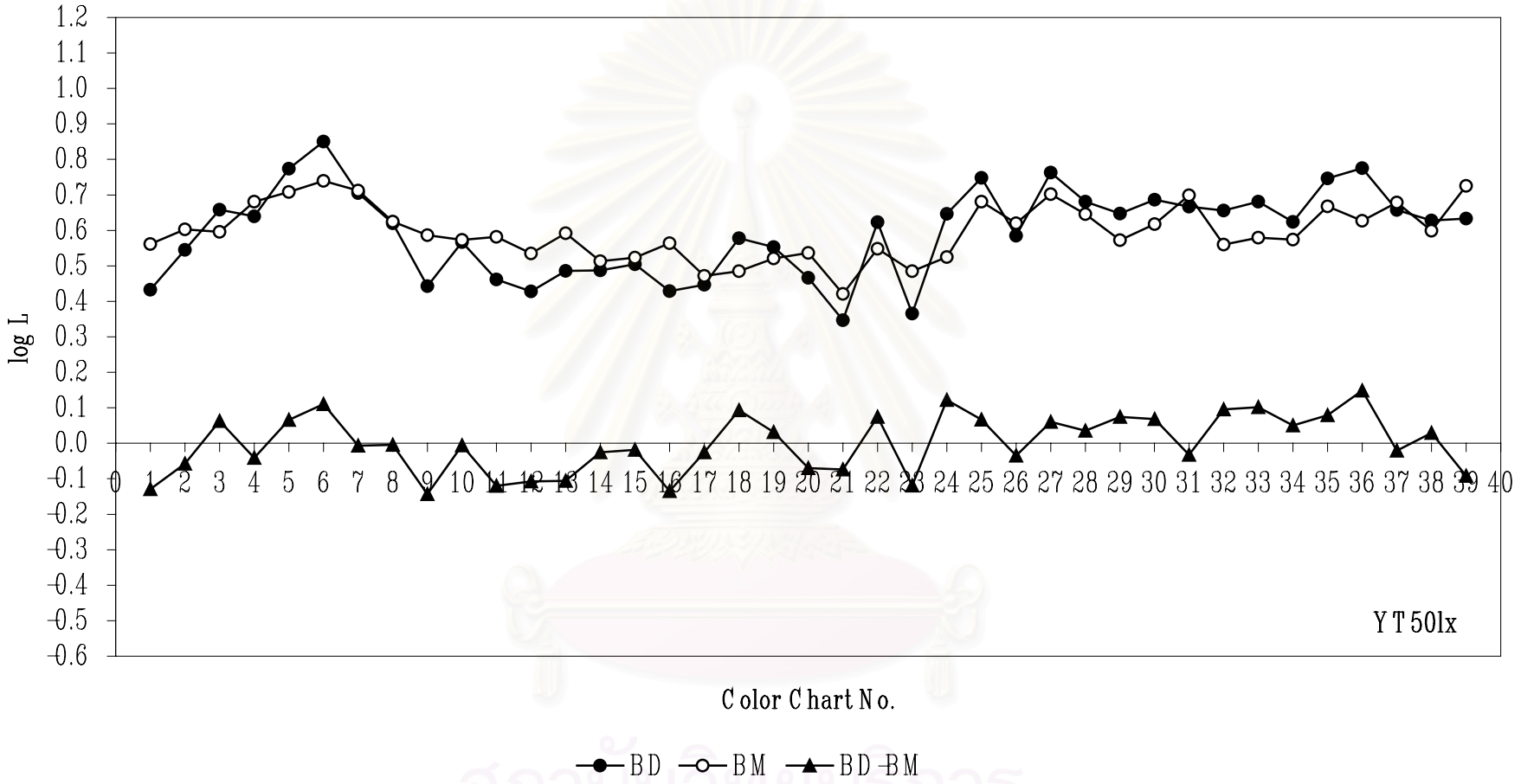


Fig. 4-20b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject YT, by plotting their results in a same graph for 50lux.

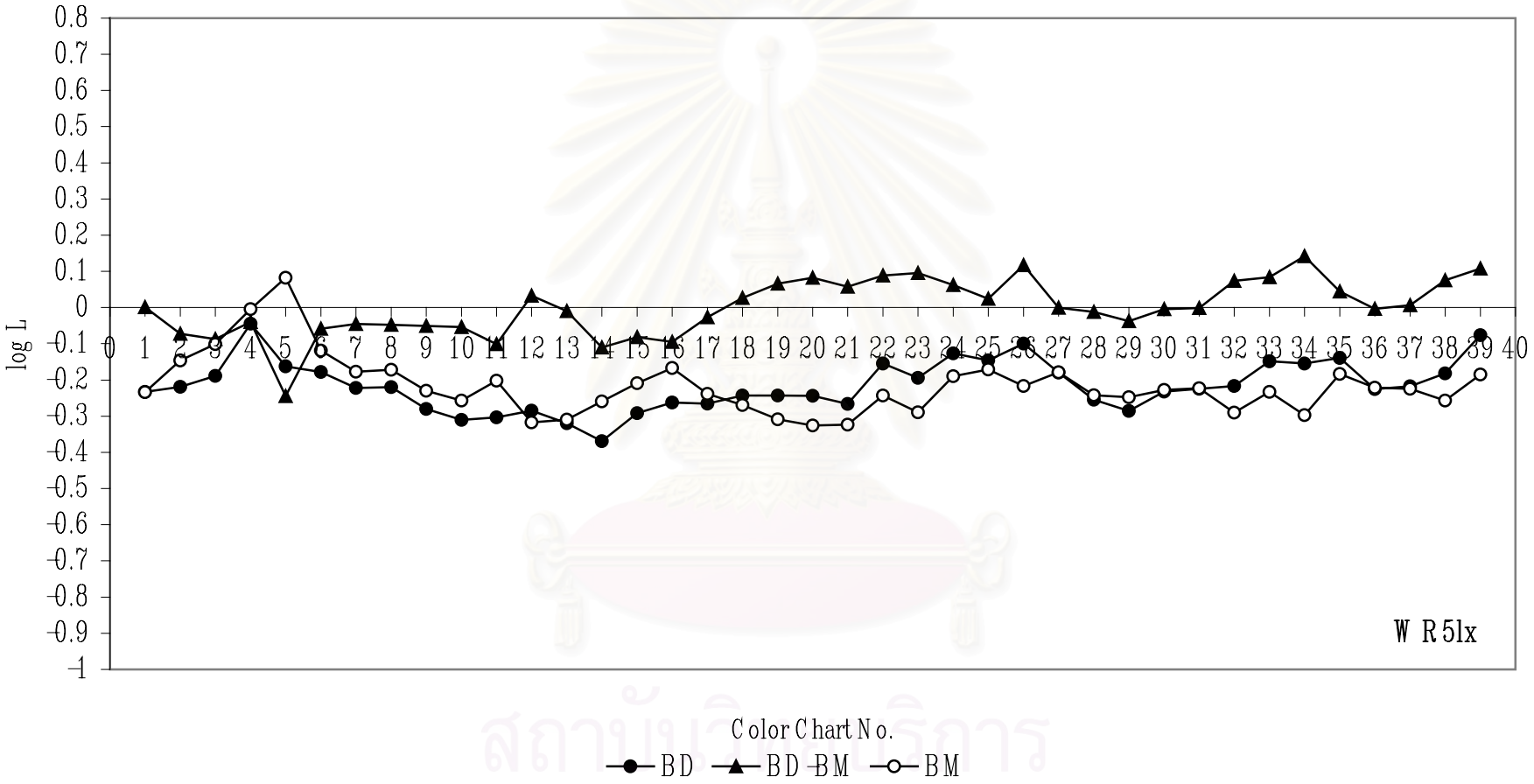


Fig. 4-21a The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject WR, by plotting their results in a same graph for 5lux.

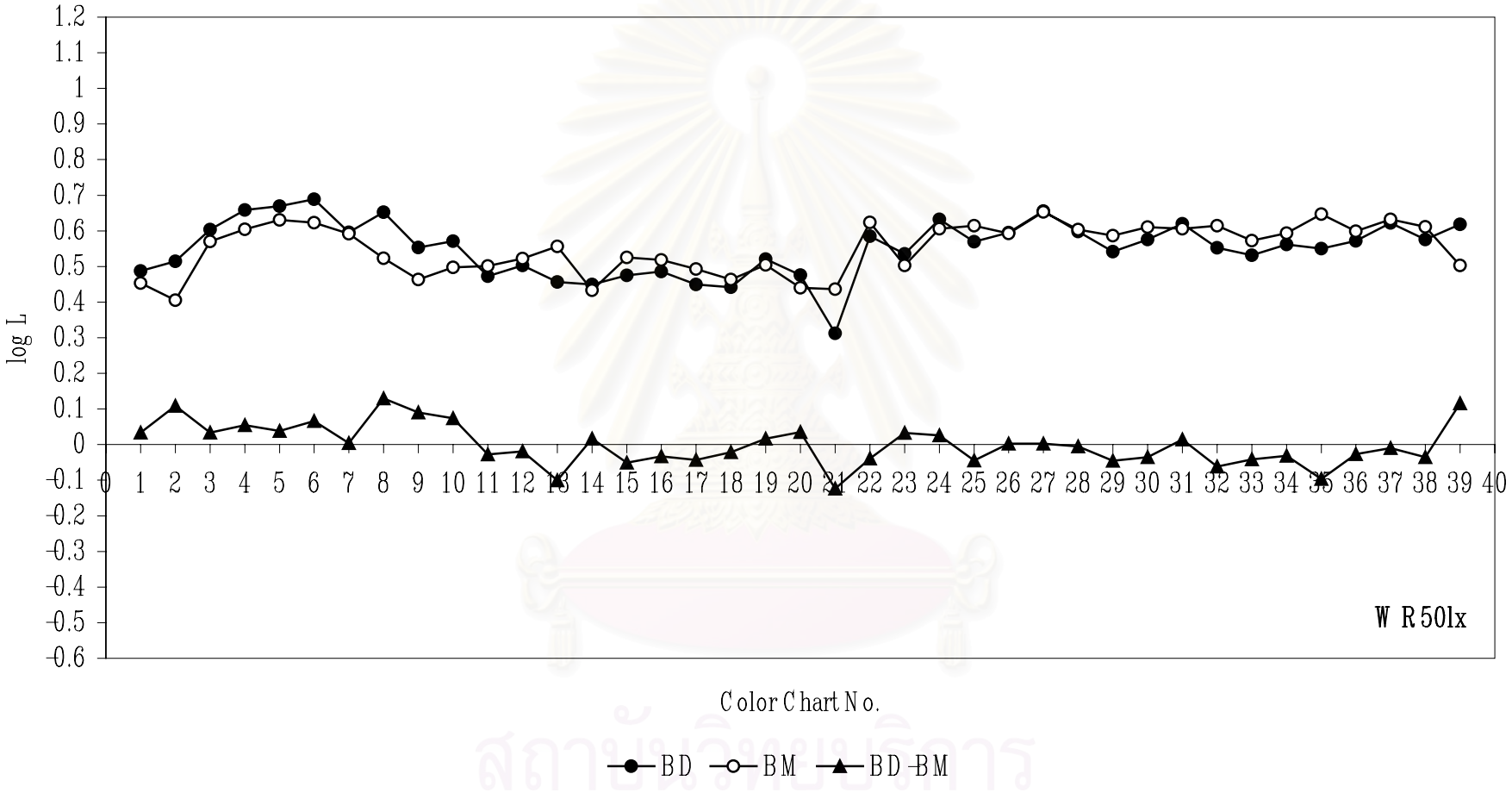


Fig. 4-21b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance, results of subject WR, by plotting their results in a same graph for 50lux.

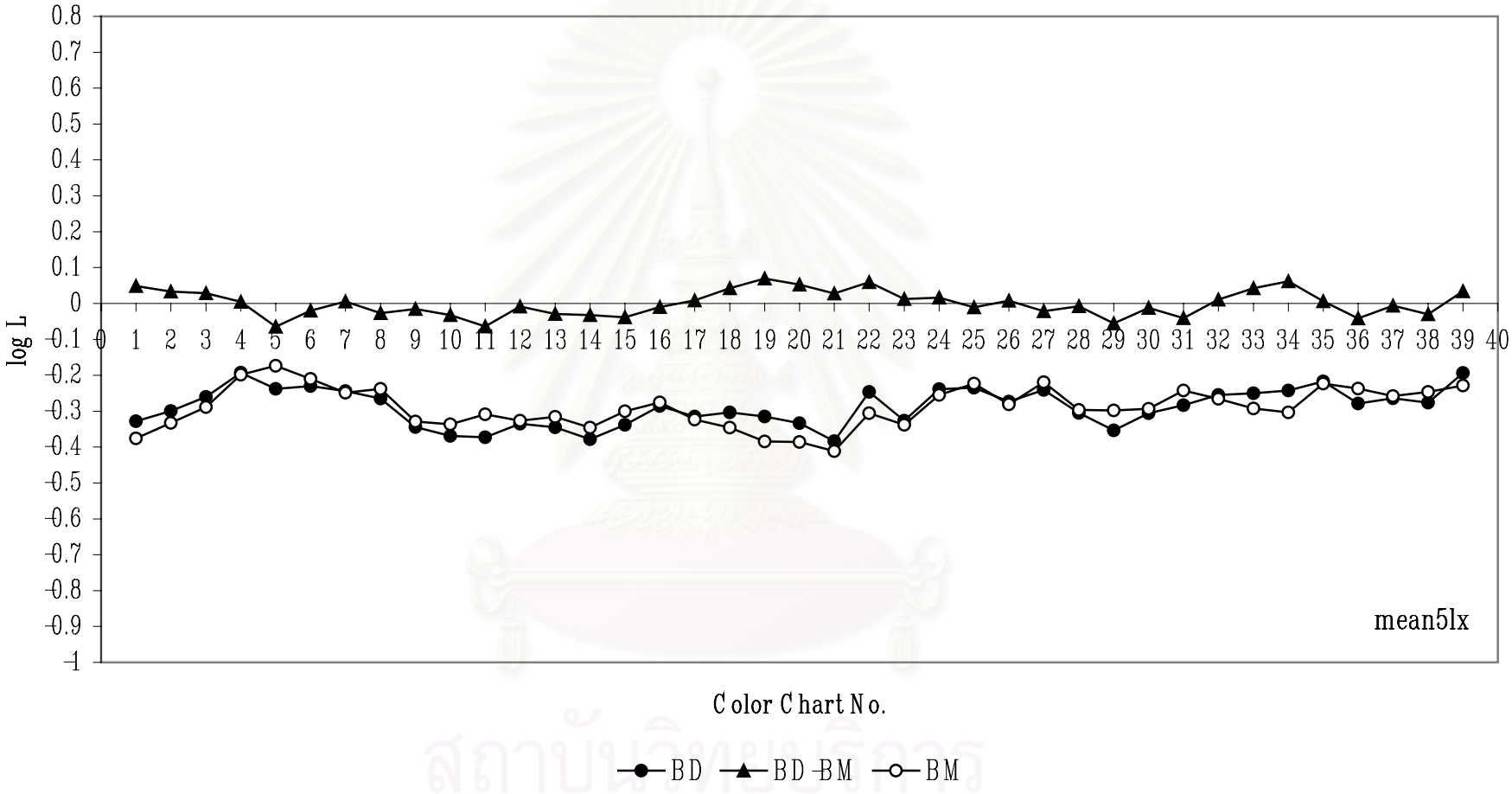


Fig. 4-22a The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance by plotting their mean results in a same graph for 5lux.

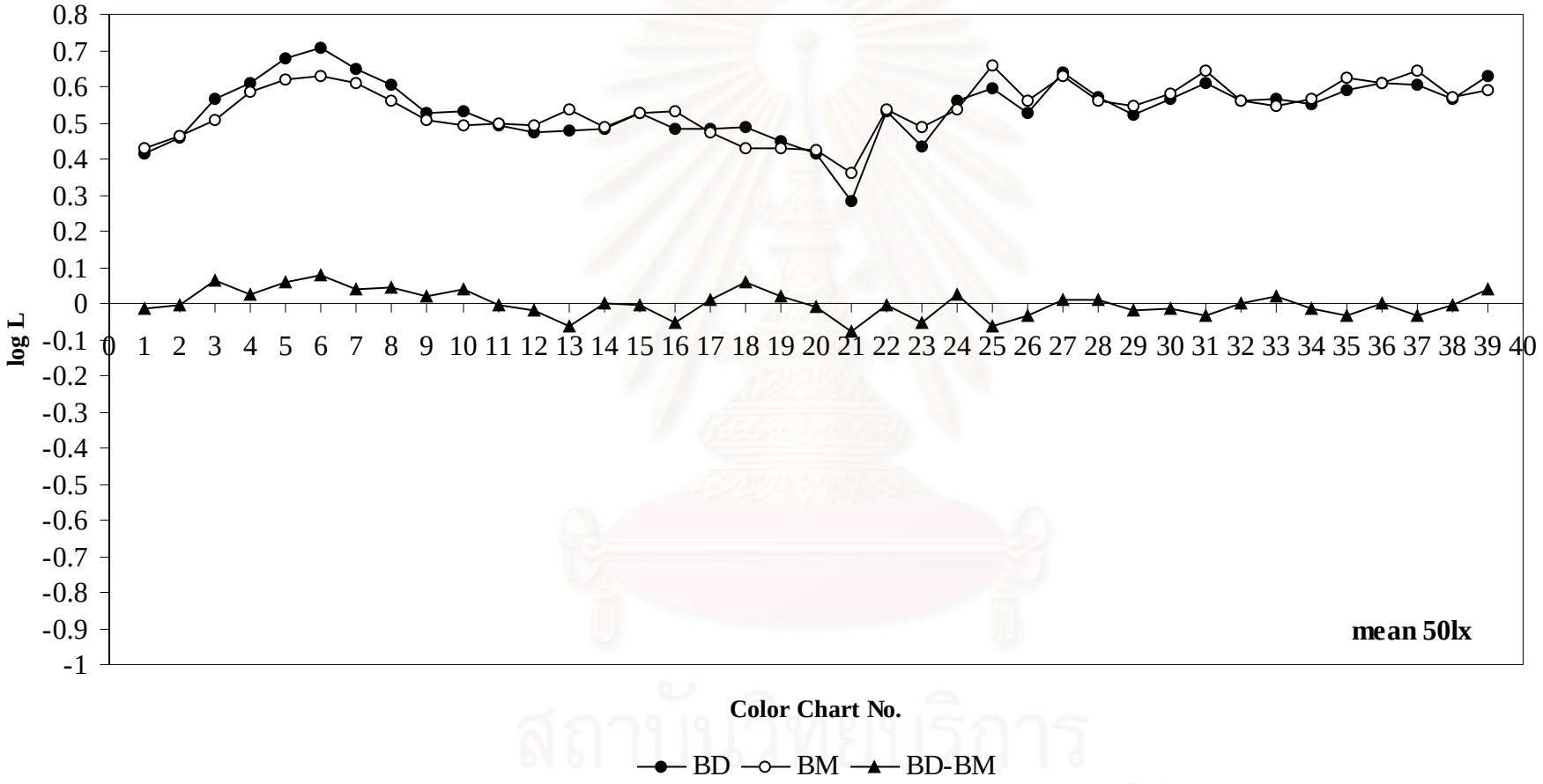


Fig. 4-22b The comparison the border(BD) and the brightness(BM) of test charts results and the subtraction the brightness luminance from the border luminance by plotting their mean results in a same graph for 50lux.

We calculated the correlation coefficients between the border and brightness luminance for each subject and the mean. The results are shown in Table 4- 5. There is high relationship between these two determinations.

Table 4-5. Correlation coefficients between the border and the brightness matching luminance.

	MI	RY	YT	WR	mean
5lux	0.71	0.61	0.60	0.47	0.60
50lux	0.79	0.64	0.76	0.69	0.72

There is found, however, a systematic variation from zero. For example, in Fig. 4-22b the difference is slightly positive for the test charts from 3 through 8, with exception of 4. These charts had a yellow color as seen in Fig. 4-23. For these yellow charts we needed to raise the luminance higher to compare it to the brightness required to reach the border. Even though the brightness on the chart had reached a high level the object still appeared natural and the subject could raise the luminance more until he or she began to feel that the object had become too bright. On the other hand, the difference is slightly negative for the test charts 13, 16, 21, 23 and 25. The first two charts had roughly speaking a blue color and the subject MI for example claimed that they appeared transparent or fluorescent before reaching a certain level of brightness. The same impression was obtained from other subjects also as pointed out in 4.2. The last three had a vivid red color and they appeared dazzling before reaching the brightness.

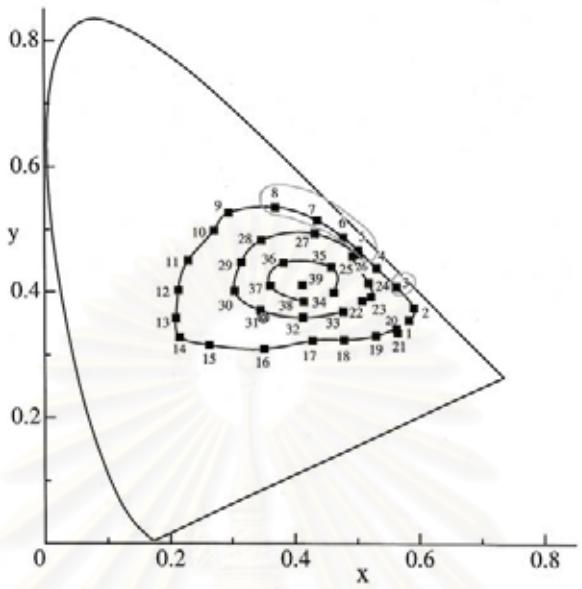


Fig. 4-23 The slight difference positive for the test charts.

We may interpret the low luminance for these red color charts by referring to the object color region of Munsell Value 7 as shown in Fig. 4-24. The color charts 1, 2, 19, 20 and 21 goes outside of the object color region if they are illuminated by the projector to become the appearance of N7. They should appear unnatural as objects in the observer's room and this is confirmed by the experimental results. This is particularly true in case of subject YT at 50 lux and to some extent with other subjects.

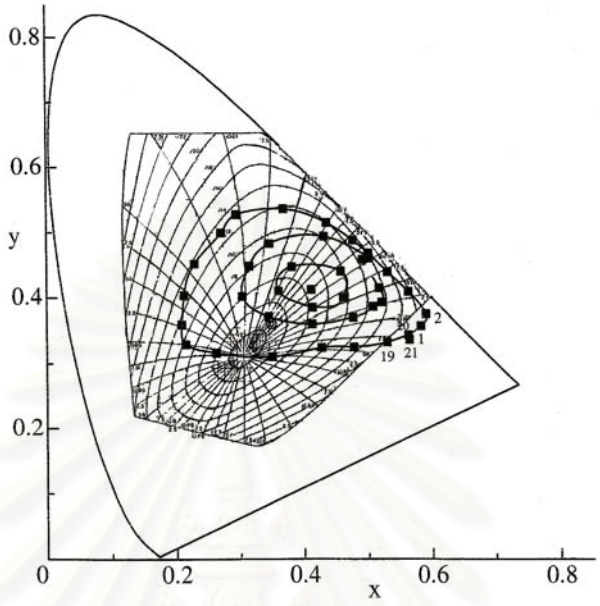


Fig. 4-24 The low luminance for red color charts by referring to the subject color region of Munsell Value 7

The reason why some test charts went out of the object gamut of N7 is because we illuminated the test charts by a projector, which can cause the spectral distributions of the charts to appear unnatural as objects in the observer's room. Let us suppose that a white paper in the observer's room produced responses S, M and L in the appropriate cones of the visual system of the observer. Further let us suppose that a test chart illuminated by the projector in the test room produced responses S', M' and L' in the S, M and L cones of the same observer. Then we can hypothesize that the appearance of the test chart becomes unnatural if S'>S, M'>M or/and L'>L.

To investigate the situation it is necessary to measure exactly the spectral distribution of the test chart at the border and of the white paper under the illuminance set in the

experiment. In this paper we measured all the spectral distributions of test charts in the test room at their borders before placing them in the aperture in the observer's room. We also measured the spectral distributions of some objects such as the wall paper, the doll, the calender, different flowers colored etc. in the observer's room at 5 and 50 lux, which are given as Appendix E. I will leave the exact analysis, however, for future investigation as it is beyond the scope of the present paper.

We can conclude that the border is determined firstly by the brightness of the test charts and secondly by their appearance. There are some other factors used to determine the border besides the brightness. One factor is the shape of the spectral distribution that reaches the subject's eyes. It may take a shape that would not exist in objects that only reflect light coming from the ceiling light and exist only when the objects were additionally and secretly illuminated by another light source. Humans may be detecting the color appearance given by the non-existing spectral distribution in normal lighting environment.

CHAPTER 5

CONCLUSION

We could obtain the border luminance of the RVSI of the observer's room for 39 color test charts beyond which the appearance became unnatural as objects in the room. We also conducted the heterochromatic brightness matching for these test charts with an achromatic chart of N7 so that we could discuss the mechanism used to determine the border. The border was firstly determined by the brightness. If the brightness of the test charts reached a certain level, roughly equal to the brightness of an achromatic chart of N7, the subjects felt that the lighting was unnatural. We tentatively proposed an equation that enabled us to derive the border luminance from the room illuminance. For further study it is suggested that should be operated other room illuminance conditions in order to find the limit of the proposed equation. The border is determined by factors other than the brightness. Some color charts began to appear dazzling, transparent, or fluorescent before they reached the brightness level. A reason for the dazzling appearance was suggested when we referred to the object color gamut in the CIE xy diagram. Measurement was made of the spectral distribution of the test charts placed both in the test room and the observer's room, and of some objects in the observer's room. This data will have significant use in the future when analysis the reasons for the unnatural appearance of the test charts. Recent findings of the cone spectral sensitivities, L, M and S suggest the usefulness of this data.

The border data can be used in many applications. Any advertising display in needs to be conspicuous and a properly assembled unnatural display will appear very conspicuous. Our data indicates just how high the luminance of the print should be. We can realize the luminance by a spot lighting. Take another example, the color reproduction from a CRT display to a print. We can easily suppose that a colored picture displayed on a CRT is in the light source color mode, while a printed picture in will be the object color mode. The color appearance modes are different and the color on the print will give a different appearance from that on the CRT. We can consider two ways to solve this problem. One is to display the picture on the CRT in the object color mode by reducing the luminance of the CRT display so that the it does not go beyond the border of the RVSI of the room where the CRT is observed. We can now establish the correct color appearance mode and make it the same for the object color. Another solution is to observe the print in the light source mode by spot lighting the print.

REFERENCES

1. Thiangthangtum, Y., Yamauchi, R., Pungrassamee, P., Hansuebsai, A. and Ikeda, M. Determination of borders of object color mode at various environmental illuminance.*AIC Abstract*. Soul(2000): 40.
2. Billmeyer, F. W., Saltzman, Jr., and Saltzman, M. *Principles of color technology*. New York: John Wiley & Sons, 1967. p. 3.
3. Ikeda, M., Motonaga, K., Matsuzawa, N. and Ishida, T. Threshold determination for unnatural color appearance with local illumination. *J. Optics (Kogaku)* 22 (1993): 289-298.
4. Ikeda, M. Appearance of colors in environment and their use in life. *Abstract of the 7th Congress of AIC*. Budapest (1993): 257-258.
5. Yamauchi, Y., Uchikawa, K and Kuriki, I. Effects of chromaticity on the upper limit of luminance for surface color mode perception. *Proc. of AIC Color 97*. Kyoto, 1 (1997): 187-190.
6. Fairchild, M. D. *Color Appearance Models*. Massachusetts: Addison Wesley Longman, 1997. pp. 64-65.
7. Hunt, R.W.G. *Measuring Color*, 2nd ed. Chichester: Ellis Hourwood, 1991. pp. 138-142.
8. Billmeyer, F. W., Saltzman, Jr., and Saltzman, M. *Principles of color technology*, 2nd ed. New York: John Wiley & Sons, 1981. pp. 28-30, 37-44.
9. Judd, D. B. and Wyszecki, G. *Color in Business, Science and Industry*, 3rd ed. New York: John Wiley & Sons, 1975. pp. 259-266, 102-125.

10. Hunt, R.W.G. *Measuring Color*, 2nd ed. Chichester: Ellis Hourwood, 1991. p. 137.

11. Hunt, R.W.G. *Measuring Color*, 2nd ed. Chichester: Ellis Hourwood, 1991. p. 140.

12. Hunt, R.W.G. *Measuring Color*, 2nd ed. Chichester: Ellis Hourwood, 1991. p. 142.

13. Billmeyer, F. W., Saltzman, Jr., and Saltzman, M. *Principles of color technology*, 2nd ed. New York: John Wiley & Sons, 1981. p. 17.

14. Fairchild, M. D. *Color Appearance Models*. Massachusetts: Addison Wesley Longman, 1997. pp. 68-69.

15. Hunt, R.W.G. *Measuring Color*, 2nd ed. Chichester: Ellis Hourwood, 1991. p. 104.

16. Wyszecki, G. and Stiles, W. S. *Color Science:Concepts and Methods, Quantitative data and Formulae,* 2nd ed. New York: John Wiley & sons, 1982. p. 144.

17. Fairchild, M. D. *Color Appearance Models*. Massachusetts: Addison Wesley Longman, 1997. p. 69.

18. Fairchild, M. D. *Color Appearance Models*. Massachusetts: Addison Wesley Longman, 1997. p. 70.

19. Judd, D. B. and Wyszecki, G. *Color in Business, Science and Industry*, 3rd ed. New York: John Wiley & Sons, 1975. pp. 259-266, 102-125.

20. Billmeyer, F. W., Saltzman, Jr., and Saltzman, M. *Principles of color technology*, 2nd ed. New York: John Wiley & Sons, 1981. p 44.

21. MINOLTA company. *Precise Color Communication :color control from feeling to instrumentation*. Osaka: Minolta, 1994. p. 46.

22. MINOLTA company. *Precise Color Communication :color control from feeling to instrumentation*. Osaka: Minolta, 1994. p. 47.

23. Williamson, S. J. and Cummins, H. M. *Light and Color in Nature and Art*. New York: Jonh Wiley & sons, 1983. p. 74.

24. Williamson, S. J. and Cummins, H. M. *Light and Color in Nature and Art*. New York: Jonh Wiley & sons, 1983. pp. 55-56.

25. MINOLTA company. *Precise Color Communication :color control from feeling to instrumentation*. Osaka: Minolta, 1994. pp.46-47.

26. Evans, R. M. *The Perception of Color*. New York: John Wiley & Sons, 1974. pp. 46 - 48.

27. Wyszecki, G. and Stiles, W. S. *Color Science:Concepts and Methods, Quantitative data and Formulae,* 2nd ed. New York: John Wiley & sons, 1982. p. 182.

28. Wyszecki, G. and Stiles, W. S. *Color Science:Concepts and Methods, Quantitative data and Formulae*, 2nd ed. New York: John Wiley & sons, 1982. p. 183.

29. Wyszecki, G. and Stiles, W. S. *Color Science:Concepts and Methods, Quantitative data and Formulae*, 2nd ed. New York: John Wiley & sons, 1982. p. 184.

30. Wyszecki, G. and Stiles, W. S. *Color Science:Concepts and Methods, Quantitative data and Formulae,* 2nd ed. New York: John Wiley & sons, 1982. pp. 179-184.

31. Williamson, S. J. and Cummins, H. M. *Light and Color in Nature and Art*. New York: Jonh Wiley & sons, 1983. p. 78.

32. Williamson, S. J. and Cummins, H. M. *Light and Color in Nature and Art*. New York: Jonh Wiley & sons, 1983. p. 79.

33. Williamson, S. J. and Cummins, H. M. *Light and Color in Nature and Art*. New York: Jonh Wiley & sons, 1983. pp. 77-80.

34. CIE. *International Lighting Vocabulary*. (n.p.): Droits de reproduction reserves, 1987. pp. 13-14.

35. JIS(Japanese Industrial Standard).

36. Prof.Mitsuo Ikeda, the president of AIC department of Photonics, Ritsumeikan university, Japan

37. Evans, R. M. *The Perception of Color*. New York : John Wiley & Sons, 1974. pp. 203 - 204.

38. Padgham, C. A. and Saunders, J. E. *The perception of light and colour*. London: G. Bell & Sons Ltd, 1975. pp. 94-95.

39. Ikeda, M., Shinoda, H. and Mizokami, Y. Three Dimensionality of the Recognized Visual Space of Illumination Proved by Hidden Illumination. *J. Optical Review*. 5,3 (1998): 200-205.

40. Ikeda, M., Shinoda, H. and Mizokami, Y.: Phenomena of Apparent Lightness Interpreted by the Recognized Visual Space of Illumination. *J. Optical Review*. 5,6 (1998): 380-386.

41. Ikeda, M. and Ashizawa, S. Equivalent lightness of colored objects of equal Munsell Chroma and equal Munsell Value at various illuminances. *J.Color Res. and Application*. 16(1991): 72-80.

APPENDICES

APPENDIX A

Purkinje Effects

The shift of the sensitivity curve toward shorter wavelengths as the eye becomes adapted to darker surroundings produces unusual visual effects for an attentive observer. For example, red objects, which reflect light primarily at long wavelengths, become darker because it is in this spectral region where sensitivity is lost most dramatically. Blue objects become relatively brighter because sensitivity is enhanced for short wavelengths. This phenomenon was discovered by the Czechoslovakian physiologist Johannes Purkinje in the early nineteenth century. Another consequence of the Purkinje effect is an increase in brightness of green objects compared with the surroundings, especially evident at twilight.

Illumination engineers take advantage of our separate systems of rods and cones when designing lighting for such places as the control bridge of a ship. At night if a saturated red light illuminates the instruments, only the cones respond to the light. They adapt to the level of illumination and their sensitivity is correspondingly reduced. But the rods are not activated and so retain their full sensitivity when needed for vision outdoors.

APPENDIX B

Table B-1. The spectrophotometer Spectrascan 650 measured the data at an achromatic chart N9every 2.5 steps in the wedge scale of 0 – 100

Reading	L(N9)	Log L(N9)	Reading	L(N9)	Log L(N9)
0	0	0	45	3.97	0.598791
2.5	0.37	-0.4318	47.5	4.64	0.666518
5	0.42	-0.37675	50	5.44	0.735599
7.5	0.48	-0.31876	52.5	6.37	0.804139
10	0.55	-0.25964	55	7.6	0.880814
12.5	0.63	-0.20066	57.5	8.95	0.951823
15	0.74	-0.13077	60	10.7	1.029384
17.5	0.83	-0.08092	62.5	13.1	1.117271
20	0.96	-0.01773	65	16.3	1.212188
22.5	1.1	0.041393	67.5	20.6	1.313867
25	1.26	0.100371	70	26.6	1.424882
27.5	1.44	0.158362	72.5	35.4	1.549003
30	1.65	0.217484	75	48.2	1.683047
32.5	1.9	0.278754	80	51	1.70757
35	2.18	0.338456	85	51.3	1.710117
37.5	2.54	0.404834	90	51.1	1.708421
40	2.92	0.465383	95	51.3	1.710117
42.5	3.41	0.532754			

Table B-2. The luminance of neutral density wedge filter each color chart.

Color Cha	Y	x	y	Color Cha	Y	x	y
N5	14.2	0.412	0.412	10RP4/10	10	0.563	0.343
5R4/10	10.5	0.583	0.357	5YR5/6	15.8	0.518	0.415
10R4/10	10.3	0.591	0.375	5R5/6	15.8	0.508	0.386
5YR5/10	15.8	0.563	0.409	5R5/3	14.8	0.462	0.4
10YR5/10	23.9	0.531	0.439	5RP5/6	15.6	0.477	0.37
5Y7/10	32.2	0.501	0.468	5P5/6	14.6	0.413	0.36
10Y7/10	32.5	0.477	0.488	5P5/3	14.2	0.414	0.385
5GY6/9	22.2	0.436	0.515	5PB5/6	13.6	0.345	0.371
10GY6/10	20.9	0.369	0.536	5B5/6	13.3	0.304	0.402
5G5/10	13.3	0.295	0.527	5B5/3	14	0.361	0.41
10G5/10	12.3	0.271	0.499	5BG5/6	12.8	0.315	0.448
5BG4/9	7.5	0.229	0.451	5G5/6	13.6	0.347	0.483
10BG4/9	7.21	0.213	0.403	5G5/3	14.1	0.382	0.447
5B4/9	7.14	0.209	0.359	5GY5/6	14.8	0.432	0.494
10B4/10	7.02	0.215	0.329	5Y5/6	15.5	0.492	0.458
5PB4/10	7.44	0.263	0.316	5Y5/3	15.3	0.458	0.44
10PB4/10	8.26	0.351	0.31	10R3/4	5.32	0.522	0.393
5P4/10	8.91	0.428	0.324	5Y4/6	8.86	0.502	0.46
10P4/10	9.3	0.478	0.325	10RP3/8	5.37	0.565	0.336
5RP4/10	9.89	0.53	0.332	N9	57.6	0.417	0.413

APPENDIX C

Table C-2a The luminance at chart N9 of the brightness matching experiment at 5 lux.

BORDER	L (cd/m^2)					
MI	1.2.3(No.21-38	4.5.6.7.8.9.10(No.21-38)				
	58.8	57.2				
YT	1.2.3(No.0-20)	1.2.3(No.21-38)	4.5.6(No.0-20)	4.5.6(No.21-38)	7,8(No.0-38)	9,10(No.0-38)
	44.95	44.2	45.5	48	46.7	45.7
RY	1.2.3(No.0-38)	4.5.6(No.0-38)	7.8(No.0-38)	9.10(No.0-38)		
	56.95	55.3	59.45	59.15		
WR	1.2.(No.0-38)	3,4(No.0-38)	5,6(No.0-38)	7,8(No.0-38)	9,10(No.0-38)	
	57.1	52.1	51.3	51.6	49.6	

Table C-2b The luminance at chart N9 of the brightness matching experiment at 50 lux.

Brightnes	L(cd/m^2)					
MI	1.2.3(No.21-38	4.5.6(No.21-38)	7.8.9.10(No.21-38)			
	57.4	58.1	55.7			
YT	1.2.3(No.0-20)	1.2.3(No.21-38)	4.5.6(No.0-20)	4.5.6(No.21-38)	7,8(No.0-38)	9,10(No.0-38)
	47.4	44.5	45.9	50.9	47.8	45.1
RY	1.2.3(No.0-38)	4.5.6(No.0-38)	7.8(No.0-20)	7.8(No.21-38)	9.10(No.0-38)	
	57	57.2	56.8	59.3	57.65	
WR	1.2.3(No.0-20)	1.2.3(No.21-38)	4.5.6(No.0-20)	4.5.6(No.21-38)	7,8(No.0-38)	9,10(No.0-38)
	49.5	50	48.7	48	48.3	48

APPENDIX D

Fig. D-1 The color of subjects of different color in the observer's room. (50lx)

1. L = 10.4 cd/m^2, x = 0.364, y = 0.366
2. L = 16.2 cd/m^2, x = 0.359, y = 0.362
3. L = 6.36 cd/m^2, x = 0.373, y = 0.508
4. L = 3.04 cd/m^2, x = 0.493, y = 0.332
5. L = 3.63 cd/m^2, x = 0.456, y = 0.447
6. L = 1.87 cd/m^2, x = 0.329, y = 0.289
7. L = 2.53 cd/m^2, x = 0.452, y = 0.422
8. L = 8.32 cd/m^2, x = 0.373, y = 0.375
9. L = 1.73 cd/m^2, x = 0.342, y = 0.386
10. L = 3.10 cd/m^2, x = 0.334, y = 0.332
11. L = 8.46 cd/m^2, x = 0.425, y = 0.388
12. L = 1.71 cd/m^2, x = 0.590, y = 0.326
13. L = 8.64 cd/m^2, x = 0.427, y = 0.418
14. L = 9.04 cd/m^2, x = 0.365, y = 0.366

COLOR CHART N7 L = 5.50 cd/m^2, x = 0.356, y = 0.359

COLOR CHART N9 L = 11.4 cd/m^2, x = 0.360, y = 0.362

Fig. D-2 The color of subjects of different color in the observer's room. (5lx)

1. L = 0.99 cd/m^2, x = 0.364, y = 0.368
2. L = 1.46 cd/m^2, x = 0.358, y = 0.364
3. L = 0.05 cd/m^2, x = 0.338, y = 0.539
4. L = 0.28 cd/m^2, x = 0.509, y = 0.333
5. L = 0.29 cd/m^2, x = 0.469, y = 0.460
6. L = 0.15 cd/m^2, x = 0.320, y = 0.279
7. L = 0.24 cd/m^2, x = 0.457, y = 0.432
8. L = 0.81 cd/m^2, x = 0.372, y = 0.379
9. L = 0.15 cd/m^2, x = 0.337, y = 0.396
10. L = 0.29 cd/m^2, x = 0.334, y = 0.336
11. L = 0.84 cd/m^2, x = 0.426, y = 0.390
12. L = 0.16 cd/m^2, x = 0.612, y = 0.330
13. L = 0.84 cd/m^2, x = 0.430, y = 0.425
14. L =0.90cd/m^2, x = 0.362, y = 0.367

COLOR CHART N7 L = 0.53 cd/m^2, x = 0.355, y = 0.360

COLOR CHART N9 L = 1.11 cd/m^2, x = 0.359, y = 0.365

APPENDIX E

The border experimental and the brightness matching experiment data of four subjects.

Table E-1a The border experimental data of subject MI at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	55.5	55.2	55.5	55.5	55.2	56.1	52.0	53.9	57.4	53.8		-0.44	-0.45	-0.44	-0.43	-0.44	-0.41	-0.53	-0.47	-0.38	-0.49	-0.45	0.04
10R4/10	2	55.3	55.8	56.3	57.9	60.7	57.4	55.5	57.6	57.0	57.9		-0.46	-0.44	-0.43	-0.37	-0.28	-0.39	-0.43	-0.37	-0.40	-0.37	-0.39	0.05
5YR5/10	3	55.3	54.7	54.8	47.6	50.2	52.5	51.2	50.7	49.5	50.3		-0.27	-0.29	-0.29	-0.48	-0.41	-0.34	-0.37	-0.39	-0.43	-0.41	-0.37	0.07
10YR5/10	4	49.2	50.3	46.8	45.7	47.2	48.2	49.2	48.1	47.5	48.6		-0.27	-0.24	-0.33	-0.35	-0.31	-0.28	-0.25	-0.28	-0.31	-0.28	-0.29	0.04
5Y7/10	5	46.0	44.3	45.5	44.2	42.9	44.1	43.2	42.5	44.0	41.2		-0.23	-0.27	-0.24	-0.26	-0.30	-0.26	-0.28	-0.30	-0.27	-0.35	-0.28	0.03
10Y7/10	6	43.5	43.4	42.0	45.0	44.1	44.7	42.5	42.5	40.1	38.5		-0.29	-0.29	-0.33	-0.24	-0.26	-0.24	-0.30	-0.30	-0.37	-0.41	-0.30	0.05
5GY6/9	7	49.9	49.3	50.9	48.3	48.2	49.5	51.5	47.6	47.3	46.5		-0.28	-0.30	-0.25	-0.31	-0.32	-0.28	-0.22	-0.33	-0.34	-0.36	-0.30	0.04
10GY6/10	8	43.2	44.6	47.6	48.1	47.6	47.7	46.7	44.5	48.9	48.7		-0.49	-0.45	-0.37	-0.34	-0.36	-0.36	-0.38	-0.44	-0.33	-0.33	-0.38	0.06
5G5/10	9	51.5	50.8	50.4	49.2	51.7	52.6	47.6	49.5	50.0	52.5		-0.46	-0.48	-0.49	-0.51	-0.44	-0.42	-0.55	-0.50	-0.49	-0.42	-0.48	0.04
10G5/10	10	46.8	49.5	47.2	48.7	50.7	52.2	51.6	51.8	50.9	51.5		-0.62	-0.55	-0.61	-0.56	-0.50	-0.46	-0.47	-0.47	-0.50	-0.48	-0.52	0.06
5BG4/9	11	56.5	59.5	50.5	58.8	59.2	59.7	57.6	57.7	59.7	58.5		-0.56	-0.47	-0.74	-0.48	-0.47	-0.45	-0.51	-0.51	-0.46	-0.49	-0.51	0.08
10BG4/9	12	61.5	63.7	61.5	60.8	60.7	57.6	58.5	58.7	57.7	59.9		-0.42	-0.34	-0.42	-0.43	-0.44	-0.53	-0.50	-0.49	-0.53	-0.47	-0.46	0.06
5B4/9	13	57.6	59.3	57.7	61.4	62.4	60.2	59.7	60.5	57.2	57.2		-0.55	-0.50	-0.55	-0.42	-0.38	-0.46	-0.47	-0.44	-0.55	-0.55	-0.49	0.06
10B4/10	14	58.6	60.2	59.5	58.5	57.5	60.6	59.2	60.5	58.5	58.2		-0.53	-0.48	-0.50	-0.52	-0.55	-0.45	-0.49	-0.45	-0.52	-0.53	-0.50	0.03
5PB4/10	15	59.7	60.7	60.3	61.6	62.4	61.2	61.4	60.0	58.3	60.3		-0.47	-0.44	-0.45	-0.39	-0.36	-0.40	-0.39	-0.44	-0.50	-0.44	-0.43	0.04
10PB4/10	16	62.9	62.6	63.5	62.1	62.6	62.5	60.2	60.2	61.5	62.5		-0.31	-0.32	-0.29	-0.33	-0.31	-0.31	-0.39	-0.39	-0.35	-0.32	-0.33	0.03
5P4/10	17	60.5	59.9	61.4	60.8	62.0	60.9	61.5	61.4	57.3	57.5		-0.36	-0.38	-0.33	-0.34	-0.30	-0.34	-0.31	-0.31	-0.45	-0.45	-0.36	0.06
10P4/10	18	58.3	59.5	60.3	58.3	60.6	61.5	57.4	58.3	61.2	61.6		-0.42	-0.38	-0.35	-0.40	-0.33	-0.30	-0.42	-0.40	-0.31	-0.30	-0.36	0.05
5RP4/10	19	58.3	58.2	58.2	54.2	58.3	58.2	58.5	56.7	55.7	56.7		-0.39	-0.39	-0.39	-0.50	-0.38	-0.38	-0.36	-0.42	-0.45	-0.43	-0.41	0.04
10RP4/10	20	55.5	57.3	54.8	55.9	57.3	58.7	56.2	52.5	59.6	59.1		-0.47	-0.41	-0.49	-0.44	-0.40	-0.36	-0.43	-0.54	-0.33	-0.35	-0.42	0.06
10RP3/8	21	63.8	63.8	64.5	61.5	63.2	63.5	65.4	64.5	61.2	62.3		-0.46	-0.46	-0.44	-0.54	-0.47	-0.46	-0.38	-0.42	-0.55	-0.51	-0.47	0.05
5R5/6	22	56.2	56.3	56.1	52.6	52.1	53.6	54.7	55.3	54.4	53.8		-0.25	-0.24	-0.25	-0.34	-0.36	-0.31	-0.27	-0.25	-0.29	-0.31	-0.29	0.04
10R3/4	23	66.2	66.6	66.3	67.8	68.5	68.5	66.2	67.5	64.2	64.6		-0.37	-0.36	-0.37	-0.29	-0.26	-0.26	-0.35	-0.30	-0.44	-0.43	-0.34	0.06
5YR5/6	24	55.5	52.5	53.2	55.5	55.5	56.1	53.5	53.2	52.0	51.8		-0.27	-0.36	-0.34	-0.25	-0.25	-0.24	-0.31	-0.32	-0.36	-0.37	-0.31	0.05
5Y5/6	25	56.3	53.9	54.5	55.4	53.8	55.4	54.8	51.1	55.7	53.1		-0.25	-0.32	-0.30	-0.26	-0.31	-0.26	-0.28	-0.38	-0.26	-0.34	-0.30	0.04
5Y4/6	26	62.6	61.2	62.8	60.7	60.4	61.2	58.7	59.9	58.6	56.5		-0.29	-0.34	-0.28	-0.35	-0.36	-0.33	-0.40	-0.37	-0.42	-0.48	-0.36	0.06
5GY5/6	27	57.1	54.8	55.3	52.9	52.5	53.2	54.1	51.2	52.6	54.2		-0.25	-0.32	-0.30	-0.36	-0.37	-0.35	-0.32	-0.40	-0.37	-0.32	-0.34	0.04
5G5/6	28	55.8	55.5	53.9	54.3	54.3	52.3	53.2	53.7	49.1	51.2		-0.32	-0.33	-0.38	-0.35	-0.35	-0.42	-0.38	-0.37	-0.51	-0.45	-0.39	0.06
5BG5/6	29	53.1	49.5	53.5	52.1	53.6	54.9	53.8	52.7	49.5	49.5		-0.43	-0.53	-0.42	-0.45	-0.40	-0.36	-0.39	-0.42	-0.52	-0.52	-0.44	0.06
5B5/6	30	55.6	54.5	54.9	53.9	53.9	53.9	50.1	53.4	54.2	54.5		-0.34	-0.37	-0.36	-0.38	-0.38	-0.38	-0.48	-0.39	-0.37	-0.36	-0.38	0.04
5PB5/6	31	58.2	56.9	57.0	58.8	57.7	57.5	53.0	52.5	53.4	52.2		-0.25	-0.29	-0.29	-0.22	-0.26	-0.26	-0.39	-0.40	-0.39	-0.42	-0.32	0.07
5P5/6	32	56.6	58.4	57.3	58.6	58.8	58.2	54.7	53.2	56.8	55.5		-0.27	-0.22	-0.25	-0.20	-0.19	-0.21	-0.30	-0.35	-0.25	-0.29	-0.25	0.05
5RP5/6	33	53.2	54.4	55.2	52.6	52.5	54.6	51.8	52.1	52.6	48.3		-0.34	-0.31	-0.28	-0.35	-0.35	-0.29	-0.36	-0.35	-0.35	-0.47	-0.34	0.05
5R5/3	34	57.2	57.4	57.5	56.5	56.7	56.2	56.2	52.1	53.6	54.6		-0.25	-0.24	-0.24	-0.25	-0.25	-0.26	-0.26	-0.38	-0.34	-0.31	-0.28	0.05
5Y5/3	35	54.9	54.7	55.5	57.5	56.9	57.9	53.2	57.1	55.2	53.7		-0.30	-0.30	-0.28	-0.21	-0.23	-0.20	-0.33	-0.22	-0.28	-0.33	-0.27	0.05
5G5/3	36	56.7	55.2	55.1	52.6	54.5	53.2	53.8	53.5	50.7	51.5		-0.28	-0.33	-0.33	-0.39	-0.33	-0.37	-0.35	-0.36	-0.45	-0.42	-0.36	0.05
5B5/3	37	56.0	57.9	56.9	55.1	54.6	55.1	52.8	55.4	55.1	54.5		-0.31	-0.25	-0.28	-0.32	-0.33	-0.32	-0.38	-0.30	-0.32	-0.34	-0.31	0.03
5P5/3	38	58.5	57.8	56.5	55.2	55.6	56.9	55.2	57.7	54.9	54.1		-0.23	-0.25	-0.29	-0.31	-0.30	-0.26	-0.30	-0.23	-0.32	-0.35	-0.28	0.04
N5	39	55.7	58.3	57.8	58.4	57.8	56.3	57.4	56.5	52.7	52.7		-0.31	-0.23	-0.25	-0.22	-0.23	-0.28	-0.24	-0.27	-0.39	-0.39	-0.28	0.06

Table E-1b The border experimental data of subject MI at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	65.8	63.9	62.5	59.8	61.0	61.0	61.5	60.2	60.5	61.5		0.50	0.43	0.37	0.28	0.32	0.32	0.34	0.29	0.30	0.34	0.35	0.07
10R4/10	2	64.0	64.6	64.2	65.6	65.6	65.2	61.3	58.2	62.1	62.0		0.43	0.46	0.44	0.50	0.50	0.48	0.33	0.23	0.36	0.36	0.41	0.09
5YR5/10	3	59.8	60.8	61.0	58.5	58.1	59.1	58.0	58.0	57.5	58.8		0.48	0.51	0.52	0.44	0.42	0.45	0.42	0.42	0.40	0.44	0.45	0.04
10YR5/10	4	59.0	58.5	60.0	56.5	57.8	59.2	54.5	54.8	53.0	53.5		0.62	0.60	0.65	0.54	0.58	0.62	0.49	0.49	0.44	0.46	0.55	0.08
5Y7/10	5	57.1	55.8	58.5	54.1	54.8	54.2	55.0	53.0	52.0	52.0		0.71	0.67	0.75	0.62	0.64	0.62	0.65	0.58	0.56	0.56	0.63	0.06
10Y7/10	6	56.8	56.0	57.1	54.5	57.5	57.0	56.9	53.5	53.5	53.9		0.70	0.68	0.71	0.63	0.72	0.71	0.70	0.60	0.60	0.61	0.67	0.05
5GY6/9	7	62.9	62.9	60.1	58.9	57.5	60.7	60.2	60.2	60.2	59.5		0.73	0.73	0.63	0.59	0.55	0.65	0.63	0.63	0.63	0.61	0.64	0.06
10GY6/10	8	60.3	61.1	61.8	58.1	57.0	59.4	57.5	58.5	56.5	58.0		0.61	0.64	0.66	0.54	0.51	0.58	0.52	0.55	0.49	0.54	0.56	0.06
5G5/10	9	66.2	66.0	66.1	62.9	63.1	64.0	59.4	58.9	61.0	63.5		0.63	0.62	0.63	0.50	0.51	0.55	0.38	0.37	0.44	0.53	0.52	0.10
10G5/10	10	64.0	62.0	63.2	60.4	60.2	64.0	59.0	59.2	61.1	60.8		0.52	0.45	0.49	0.39	0.39	0.52	0.35	0.36	0.42	0.41	0.43	0.07
5BG4/9	11	67.0	67.5	69.5	69.1	69.0	69.1	67.4	67.0	64.9	66.9		0.41	0.43	0.52	0.50	0.50	0.50	0.43	0.41	0.33	0.41	0.44	0.06
10BG4/9	12	67.1	69.0	68.9	67.0	66.5	68.0	66.0	66.0	66.5	67.8		0.40	0.49	0.48	0.40	0.38	0.44	0.36	0.36	0.38	0.43	0.41	0.05
5B4/9	13	68.9	68.2	68.5	67.7	66.1	65.3	66.5	66.5	63.5	65.2		0.47	0.44	0.45	0.42	0.35	0.32	0.37	0.37	0.25	0.32	0.38	0.07
10B4/10	14	70.2	72.3	71.1	67.5	68.8	68.5	67.2	66.2	67.0	67.5		0.54	0.64	0.58	0.42	0.47	0.46	0.40	0.36	0.40	0.42	0.47	0.09
5PB4/10	15	69.5	71.2	71.1	69.8	70.0	70.0	63.5	66.5	67.5	67.2		0.53	0.61	0.60	0.54	0.55	0.55	0.28	0.40	0.44	0.43	0.49	0.10
10PB4/10	16	69.8	70.5	72.0	71.0	70.2	70.0	67.2	66.0	66.2	65.5		0.58	0.61	0.69	0.64	0.60	0.59	0.46	0.42	0.42	0.40	0.54	0.10
5P4/10	17	66.8	67.1	66.8	67.5	68.0	68.0	67.1	67.0	65.2	64.2		0.49	0.50	0.49	0.52	0.54	0.54	0.50	0.49	0.42	0.38	0.49	0.05
10P4/10	18	64.8	65.2	66.0	64.1	66.5	66.5	63.8	64.5	63.5	66.0		0.42	0.43	0.47	0.39	0.49	0.49	0.38	0.41	0.37	0.47	0.43	0.04
5RP4/10	19	63.5	64.9	65.1	63.9	64.0	65.3	59.0	60.0	61.0	61.5		0.39	0.44	0.45	0.41	0.41	0.46	0.23	0.27	0.30	0.32	0.37	0.08
10RP4/10	20	64.5	64.1	64.2	61.1	63.1	63.2	60.4	60.2	61.0	59.5		0.43	0.42	0.42	0.31	0.38	0.38	0.28	0.27	0.30	0.25	0.34	0.07
10RP3/8	21	63.0	63.1	64.7	68.0	67.6	68.6	66.2	63.8	64.2	62.8		0.17	0.17	0.23	0.36	0.34	0.38	0.28	0.19	0.20	0.15	0.25	0.09
5R5/6	22	58.3	57.8	56.5	56.0	53.5	53.6	55.8	55.6	59.8	58.6		0.48	0.46	0.42	0.40	0.32	0.33	0.39	0.39	0.51	0.47	0.42	0.06
10R3/4	23	68.5	68.5	69.3	69.6	70.3	70.0	68.5	68.8	68.8	69.4		0.39	0.39	0.42	0.42	0.46	0.44	0.37	0.39	0.39	0.41	0.41	0.03
5YR5/6	24	57.5	58.2	59.0	60.5	61.2	60.5	51.5	53.3	57.5	60.8		0.45	0.47	0.50	0.54	0.56	0.54	0.26	0.32	0.44	0.55	0.46	0.10
5Y5/6	25	66.0	59.5	60.0	58.2	59.6	59.6	61.0	60.7	59.3	58.6		0.74	0.51	0.52	0.45	0.50	0.50	0.54	0.53	0.49	0.47	0.52	0.08
5Y4/6	26	63.5	65.5	65.9	65.0	66.5	67.9	66.0	63.8	64.2	63.8		0.40	0.48	0.50	0.45	0.51	0.57	0.49	0.40	0.42	0.40	0.46	0.06
5GY5/6	27	60.7	60.1	61.7	63.3	64.7	65.4	61.6	61.1	61.3	61.2		0.53	0.50	0.56	0.61	0.66	0.69	0.55	0.53	0.53	0.53	0.57	0.06
5G5/6	28	57.5	59.5	59.3	60.3	66.2	61.9	57.0	58.1	59.8	61.4		0.39	0.45	0.44	0.46	0.68	0.52	0.36	0.39	0.45	0.50	0.46	0.09
5BG5/6	29	60.3	61.6	61.3	59.2	57.5	57.7	57.0	56.8	61.1	60.6		0.45	0.49	0.48	0.40	0.35	0.35	0.33	0.33	0.46	0.45	0.41	0.06
5B5/6	30	63.5	64.3	63.0	59.0	61.5	62.1	57.1	59.7	59.5	61.2		0.58	0.61	0.56	0.41	0.50	0.52	0.35	0.43	0.43	0.48	0.49	0.08
5PB5/6	31	63.5	64.7	69.5	63.7	62.9	62.1	59.7	61.1	63.7	64.8		0.59	0.64	0.84	0.59	0.56	0.53	0.44	0.49	0.59	0.63	0.59	0.11
5P5/6	32	60.5	60.2	61.2	61.7	62.1	62.2	58.7	57.7	61.5	59.3		0.51	0.50	0.54	0.54	0.56	0.56	0.44	0.41	0.54	0.46	0.51	0.05
5RP5/6	33	54.8	57.0	58.5	60.5	61.2	60.5	58.5	58.6	56.1	58.8		0.37	0.43	0.48	0.53	0.55	0.53	0.47	0.47	0.39	0.47	0.47	0.06
5R5/3	34	60.5	61.5	60.5	59.8	58.5	60.7	59.5	60.2	59.4	59.9		0.52	0.55	0.52	0.48	0.44	0.51	0.47	0.50	0.47	0.49	0.50	0.03
5Y5/3	35	63.0	63.8	64.0	61.0	62.6	61.2	58.6	57.2	58.3	60.4		0.62	0.65	0.66	0.54	0.60	0.55	0.46	0.42	0.45	0.52	0.55	0.09
5G5/3	36	60.5	64.5	66.5	62.6	64.5	63.4	60.8	63.5	60.6	60.9		0.50	0.64	0.72	0.56	0.63	0.59	0.50	0.59	0.49	0.50	0.57	0.08
5B5/3	37	64.0	65.0	64.5	64.0	62.6	63.5	62.6	61.2	61.5	62.6		0.62	0.66	0.64	0.61	0.56	0.59	0.56	0.51	0.52	0.56	0.58	0.05
5P5/3	38	63.0	64.5	63.1	58.9	59.6	59.3	60.1	60.1	58.4	61.6		0.59	0.65	0.59	0.44	0.46	0.45	0.47	0.47	0.42	0.53	0.51	0.08
N5	39	65.5	66.5	66.0	66.1	67.0	66.8	62.5	63.9	64.2	63.2		0.63	0.67	0.65	0.65	0.69	0.68	0.51	0.57	0.58	0.54	0.62	0.06

Table E-2a The border experimental data of subject RY at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	57.6	60.5	58.7	60.3	59.7	55.6	56.5	55.4	56.1	58.8		-0.37	-0.28	-0.34	-0.27	-0.29	-0.43	-0.40	-0.43	-0.42	-0.34	-0.36	0.06
10R4/10	2	61.8	61.5	61.0	60.8	60.2	59.1	60.1	60.6	60.2	58.6		-0.24	-0.25	-0.27	-0.26	-0.29	-0.33	-0.30	-0.28	-0.30	-0.35	-0.29	0.03
5YR5/10	3	58.4	59.5	58.4	56.3	56.3	56.4	57.3	57.6	54.2	54.1		-0.17	-0.13	-0.17	-0.22	-0.22	-0.23	-0.20	-0.19	-0.30	-0.30	-0.21	0.05
10YR5/10	4	53.5	52.5	52.7	51.2	50.7	48.8	50.6	49.6	50.5	50.5		-0.13	-0.16	-0.16	-0.19	-0.20	-0.27	-0.22	-0.24	-0.22	-0.22	-0.20	0.04
5Y7/10	5	44.2	46.1	46.5	45.5	46.6	43.6	44.5	44.6	45.7	45.6		-0.26	-0.21	-0.20	-0.21	-0.18	-0.28	-0.25	-0.25	-0.23	-0.23	-0.23	0.03
10Y7/10	6	43.5	46.4	45.2	47.5	45.7	44.7	45.6	42.9	45.7	46.2		-0.28	-0.20	-0.23	-0.16	-0.20	-0.24	-0.22	-0.29	-0.22	-0.21	-0.23	0.04
5GY6/9	7	52.2	54.5	54.8	50.6	51.1	47.6	50.1	50.1	48.6	49.9		-0.21	-0.14	-0.13	-0.24	-0.22	-0.33	-0.26	-0.26	-0.31	-0.27	-0.24	0.07
10GY6/10	8	51.5	52.4	52.6	53.7	54.8	53.4	50.3	52.0	50.0	51.1		-0.25	-0.23	-0.22	-0.17	-0.14	-0.20	-0.28	-0.24	-0.29	-0.26	-0.23	0.05
5G5/10	9	56.5	56.4	56.6	58.3	57.3	54.1	56.0	56.6	54.1	55.3		-0.30	-0.30	-0.30	-0.23	-0.26	-0.37	-0.31	-0.30	-0.37	-0.34	-0.31	0.04
10G5/10	10	57.9	60.6	61.5	56.0	58.5	57.4	56.4	56.6	52.3	55.6		-0.29	-0.21	-0.18	-0.34	-0.26	-0.31	-0.34	-0.33	-0.46	-0.36	-0.31	0.08
5BG4/9	11	62.5	64.5	63.8	63.3	63.8	61.5	62.1	63.5	63.6	65.3		-0.36	-0.28	-0.31	-0.31	-0.29	-0.39	-0.37	-0.32	-0.32	-0.25	-0.32	0.04
10BG4/9	12	61.9	63.5	63.8	64.7	66.8	65.2	64.5	65.2	65.5	66.5		-0.39	-0.33	-0.32	-0.28	-0.19	-0.27	-0.30	-0.27	-0.26	-0.22	-0.28	0.06
5B4/9	13	66.2	67.8	67.9	66.6	65.3	63.3	65.5	66.5	63.5	65.3		-0.23	-0.17	-0.16	-0.20	-0.26	-0.35	-0.26	-0.22	-0.34	-0.27	-0.25	0.06
10B4/10	14	62.2	67.8	63.0	64.7	65.7	60.6	62.6	63.8	63.7	63.5		-0.39	-0.17	-0.36	-0.29	-0.25	-0.45	-0.38	-0.33	-0.34	-0.35	-0.33	0.08
5PB4/10	15	63.6	65.1	65.9	63.5	64.3	59.5	61.6	61.6	61.9	64.3		-0.32	-0.26	-0.23	-0.31	-0.28	-0.46	-0.39	-0.39	-0.38	-0.29	-0.33	0.07
10PB4/10	16	62.2	63.4	64.6	66.2	65.6	61.5	62.7	62.4	62.5	63.8		-0.32	-0.28	-0.23	-0.16	-0.18	-0.35	-0.31	-0.32	-0.32	-0.27	-0.27	0.06
5P4/10	17	63.5	65.2	65.7	63.5	64.2	60.4	60.5	61.2	58.2	58.8		-0.24	-0.18	-0.16	-0.23	-0.20	-0.35	-0.35	-0.33	-0.43	-0.41	-0.29	0.10
10P4/10	18	61.6	64.3	62.9	60.0	64.5	52.8	57.5	59.6	58.4	60.6		-0.29	-0.19	-0.25	-0.34	-0.17	-0.57	-0.43	-0.36	-0.40	-0.33	-0.33	0.12
5RP4/10	19	61.5	62.2	58.4	60.2	60.8	55.3	56.8	56.5	58.1	58.2		-0.27	-0.25	-0.37	-0.30	-0.28	-0.46	-0.42	-0.43	-0.39	-0.38	-0.36	0.07
10RP4/10	20	61.0	62.1	62.3	60.1	59.9	56.1	60.6	60.5	55.1	51.0		-0.28	-0.24	-0.24	-0.30	-0.31	-0.44	-0.30	-0.30	-0.47	-0.59	-0.35	0.11
10RP3/8	21	63.9	65.0	64.2	63.6	66.3	64.2	66.5	64.4	64.4	66.3		-0.45	-0.41	-0.44	-0.45	-0.34	-0.44	-0.34	-0.43	-0.43	-0.36	-0.41	0.04
5R5/6	22	56.6	56.4	56.7	56.8	57.7	55.1	54.6	54.7	54.2	54.9		-0.22	-0.23	-0.22	-0.20	-0.18	-0.27	-0.28	-0.28	-0.30	-0.27	-0.24	0.04
10R3/4	23	65.5	67.3	67.2	67.8	68.6	63.3	65.6	67.3	65.6	67.8		-0.39	-0.32	-0.32	-0.28	-0.25	-0.47	-0.38	-0.32	-0.39	-0.30	-0.34	0.07
5YR5/6	24	53.7	56.6	55.7	57.5	57.6	55.7	57.4	57.2	53.6	54.7		-0.31	-0.22	-0.25	-0.18	-0.18	-0.25	-0.20	-0.21	-0.31	-0.28	-0.24	0.05
5Y5/6	25	54.0	56.0	55.0	57.7	58.4	56.6	57.7	57.5	53.9	56.0		-0.31	-0.25	-0.28	-0.19	-0.16	-0.23	-0.20	-0.21	-0.31	-0.25	-0.24	0.05
5Y4/6	26	58.0	60.8	60.5	63.3	62.8	62.2	63.5	62.9	59.9	61.1		-0.43	-0.34	-0.35	-0.24	-0.26	-0.29	-0.24	-0.27	-0.38	-0.34	-0.31	0.06
5GY5/6	27	56.3	57.2	57.2	59.3	60.2	55.5	56.5	57.6	55.6	57.4		-0.26	-0.23	-0.23	-0.16	-0.13	-0.28	-0.25	-0.22	-0.28	-0.23	-0.23	0.05
5G5/6	28	56.5	57.5	57.2	55.8	56.2	54.5	55.6	56.3	50.8	54.5		-0.29	-0.26	-0.27	-0.30	-0.29	-0.35	-0.32	-0.30	-0.46	-0.35	-0.32	0.06
5BG5/6	29	56.5	57.5	56.5	54.9	56.2	56.1	57.6	56.6	53.2	55.5		-0.32	-0.29	-0.32	-0.35	-0.31	-0.33	-0.29	-0.31	-0.42	-0.35	-0.33	0.04
5B5/6	30	57.2	56.6	58.1	56.0	59.6	54.5	57.1	57.6	56.8	58.6		-0.28	-0.30	-0.25	-0.30	-0.19	-0.36	-0.28	-0.27	-0.29	-0.24	-0.28	0.04
5PB5/6	31	58.3	55.6	55.8	52.5	55.5	58.9	59.7	60.7	57.5	58.4		-0.24	-0.32	-0.31	-0.40	-0.31	-0.22	-0.19	-0.16	-0.27	-0.24	-0.26	0.07
5P5/6	32	56.6	56.8	56.8	56.9	58.1	55.5	57.3	58.4	55.5	55.6		-0.26	-0.25	-0.25	-0.24	-0.20	-0.29	-0.24	-0.20	-0.29	-0.29	-0.25	0.03
5RP5/6	33	55.6	57.5	57.5	54.5	55.5	54.3	55.6	53.6	54.1	56.5		-0.26	-0.20	-0.20	-0.28	-0.25	-0.29	-0.26	-0.32	-0.30	-0.23	-0.26	0.04
5R5/3	34	56.6	56.6	56.7	53.6	55.5	56.9	57.6	58.7	55.3	55.6		-0.25	-0.25	-0.25	-0.33	-0.27	-0.24	-0.22	-0.19	-0.29	-0.28	-0.26	0.04
5Y5/3	35	57.2	57.0	56.5	56.6	58.1	56.2	57.6	58.6	55.4	56.3		-0.22	-0.23	-0.24	-0.22	-0.18	-0.25	-0.21	-0.18	-0.27	-0.25	-0.22	0.03
5G5/3	36	55.5	57.2	57.3	57.6	58.4	56.3	57.2	55.4	55.9	55.6		-0.30	-0.25	-0.25	-0.23	-0.21	-0.28	-0.25	-0.31	-0.30	-0.30	-0.27	0.03
5B5/3	37	56.0	56.0	57.6	52.0	54.4	59.2	58.5	59.1	56.1	57.5		-0.29	-0.29	-0.25	-0.40	-0.33	-0.20	-0.22	-0.20	-0.29	-0.25	-0.27	0.06
5P5/3	38	56.7	56.4	56.2	54.1	55.5	55.2	55.6	54.0	56.7	57.1		-0.27	-0.27	-0.28	-0.33	-0.29	-0.31	-0.30	-0.34	-0.27	-0.26	-0.29	0.03
N5	39	59.6	60.1	60.0	54.2	55.5	54.6	55.9	54.6	54.3	55.7		-0.18	-0.16	-0.17	-0.33	-0.29	-0.33	-0.29	-0.33	-0.34	-0.30	-0.27	0.07

Table E-2b The border experimental data of subject RY at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	60.0	59.2	59.0	59.5	61.2	63.4	61.5	64.0	62.1	63.6		0.34	0.31	0.31	0.31	0.37	0.45	0.41	0.50	0.43	0.48	0.39	0.07
10R4/10	2	61.0	62.5	62.3	53.7	53.5	60.2	65.0	64.4	61.7	64.4		0.36	0.42	0.41	0.13	0.12	0.32	0.53	0.51	0.41	0.51	0.37	0.15
5YR5/10	3	59.0	61.7	60.0	61.1	61.5	63.8	58.7	60.2	63.2	62.1		0.48	0.58	0.52	0.54	0.56	0.64	0.49	0.54	0.65	0.61	0.56	0.06
10YR6/10	4	56.1	56.4	55.4	56.6	57.4	57.5	57.8	53.5	57.6	58.2		0.58	0.59	0.56	0.58	0.60	0.60	0.65	0.52	0.64	0.66	0.60	0.04
5Y7/10	5	50.5	50.6	52.0	53.2	52.7	54.5	52.5	55.0	57.9	58.8		0.54	0.55	0.59	0.61	0.59	0.65	0.62	0.69	0.78	0.80	0.64	0.09
10Y7/10	6	52.2	52.5	50.5	53.7	54.1	51.8	48.8	52.8	59.0	57.5		0.60	0.60	0.55	0.63	0.64	0.57	0.52	0.63	0.81	0.77	0.63	0.09
5GY6/9	7	57.2	57.6	58.0	58.7	59.0	58.8	58.3	59.1	64.3	62.4		0.58	0.59	0.60	0.61	0.62	0.61	0.63	0.65	0.84	0.76	0.65	0.08
10GY6/10	8	55.6	56.5	57.4	58.8	59.0	60.1	54.1	57.7	61.7	60.0		0.51	0.53	0.56	0.59	0.59	0.63	0.48	0.58	0.71	0.65	0.58	0.07
5G5/10	9	59.0	61.2	59.6	65.6	66.2	65.8	64.7	66.3	64.7	67.2		0.41	0.48	0.43	0.64	0.66	0.64	0.63	0.70	0.63	0.73	0.59	0.11
10G5/10	10	65.5	64.6	64.4	62.6	65.3	66.5	62.3	63.1	63.2	64.3		0.61	0.57	0.57	0.49	0.59	0.64	0.51	0.54	0.54	0.58	0.56	0.05
5BG4/9	11	68.3	69.0	68.2	67.8	71.0	71.2	70.6	71.4	70.4	71.9		0.51	0.54	0.51	0.48	0.62	0.63	0.64	0.68	0.62	0.70	0.59	0.08
10BG4/9	12	66.8	69.7	69.0	68.0	70.2	69.1	71.7	68.8	70.2	71.5		0.43	0.56	0.53	0.47	0.57	0.52	0.67	0.54	0.60	0.66	0.55	0.08
5B4/9	13	67.3	68.6	69.4	69.7	70.4	70.7	71.5	72.2	72.5	71.7		0.45	0.50	0.54	0.54	0.57	0.59	0.66	0.69	0.71	0.67	0.59	0.09
10B4/10	14	67.3	67.6	69.0	68.1	70.0	70.3	69.8	70.0	69.8	71.6		0.44	0.45	0.51	0.46	0.55	0.56	0.57	0.58	0.57	0.65	0.53	0.07
5PB4/10	15	68.8	70.6	71.2	72.1	71.7	71.3	68.0	70.8	71.5	72.4		0.53	0.61	0.64	0.68	0.66	0.64	0.51	0.64	0.67	0.72	0.63	0.06
10PB4/10	16	66.6	69.3	68.7	59.8	61.3	61.5	69.0	68.1	68.4	68.4		0.48	0.60	0.57	0.21	0.27	0.27	0.60	0.56	0.57	0.57	0.47	0.16
5P4/10	17	66.2	66.0	67.2	68.7	69.8	69.1	66.5	66.7	67.6	66.5		0.50	0.49	0.54	0.59	0.64	0.61	0.53	0.54	0.57	0.53	0.55	0.05
10P4/10	18	64.3	64.5	63.2	65.2	66.5	67.4	66.8	66.3	67.2	67.6		0.44	0.45	0.40	0.46	0.52	0.55	0.56	0.54	0.57	0.59	0.51	0.07
5RP4/10	19	61.1	61.7	61.3	58.2	60.0	62.3	60.7	62.0	61.1	62.7		0.35	0.37	0.36	0.24	0.30	0.38	0.36	0.40	0.37	0.42	0.36	0.05
10RP4/10	20	59.5	59.8	59.9	63.2	63.2	63.4	61.7	62.4	61.3	61.7		0.30	0.31	0.31	0.42	0.42	0.43	0.40	0.42	0.38	0.39	0.38	0.05
10RP3/8	21	63.2	67.0	66.5	67.8	68.0	66.4	65.7	63.8	59.1	61.0		0.16	0.31	0.29	0.33	0.34	0.27	0.28	0.20	0.04	0.10	0.23	0.10
5R5/6	22	55.3	60.0	63.3	63.2	64.0	64.1	62.0	61.2	49.0	50.6		0.38	0.52	0.63	0.62	0.65	0.65	0.60	0.58	0.21	0.25	0.51	0.17
10R3/4	23	70.4	71.9	72.0	70.3	70.6	71.3	69.2	71.0	64.3	64.3		0.46	0.53	0.54	0.44	0.46	0.49	0.42	0.51	0.22	0.22	0.43	0.12
5YR5/6	24	63.5	64.9	63.9	57.5	60.1	60.8	59.6	59.5	49.4	53.2		0.64	0.69	0.66	0.43	0.51	0.53	0.52	0.52	0.22	0.33	0.50	0.15
5Y5/6	25	60.2	61.6	61.2	64.7	64.7	64.8	60.8	61.5	52.8	53.7		0.51	0.56	0.55	0.67	0.67	0.67	0.55	0.58	0.31	0.34	0.54	0.13
5Y4/6	26	65.2	65.0	67.4	66.7	67.7	68.8	65.8	68.0	57.8	59.3		0.46	0.45	0.54	0.50	0.54	0.59	0.50	0.59	0.21	0.26	0.46	0.13
5GY5/6	27	64.7	67.0	65.5	64.6	65.1	65.6	60.0	60.6	53.8	52.6		0.66	0.75	0.69	0.64	0.66	0.68	0.51	0.53	0.32	0.28	0.57	0.16
5G5/6	28	64.0	65.3	64.7	63.8	66.0	66.8	60.5	61.0	51.9	55.7		0.60	0.65	0.62	0.57	0.66	0.69	0.49	0.50	0.23	0.34	0.53	0.15
5BG5/6	29	64.0	63.3	65.0	61.0	64.5	63.8	61.6	62.7	55.6	56.7		0.57	0.54	0.61	0.45	0.58	0.55	0.50	0.54	0.31	0.34	0.50	0.10
5B5/6	30	60.6	62.6	64.5	62.4	62.6	63.7	64.2	65.6	54.7	55.5		0.46	0.53	0.60	0.51	0.52	0.56	0.61	0.67	0.30	0.32	0.51	0.12
5PB5/6	31	63.5	64.2	63.0	65.5	66.5	66.8	66.7	64.4	53.5	54.7		0.58	0.60	0.56	0.64	0.68	0.69	0.72	0.63	0.27	0.31	0.57	0.16
5P5/6	32	63.2	63.6	62.6	61.3	64.8	64.3	59.7	61.2	55.6	56.2		0.60	0.61	0.57	0.51	0.64	0.62	0.49	0.54	0.37	0.38	0.53	0.10
5RP5/6	33	60.2	60.0	60.8	64.1	64.7	64.6	63.3	63.8	58.6	61.2		0.52	0.51	0.54	0.65	0.67	0.66	0.65	0.67	0.48	0.57	0.59	0.07
5R5/3	34	61.0	61.8	62.5	63.5	64.2	65.7	62.6	61.7	50.7	53.5		0.52	0.55	0.58	0.60	0.63	0.69	0.60	0.57	0.23	0.31	0.53	0.14
5Y5/3	35	61.3	61.4	61.8	65.6	66.3	64.5	60.2	58.2	51.6	51.4		0.55	0.55	0.56	0.70	0.72	0.65	0.53	0.46	0.27	0.26	0.53	0.16
5G5/3	36	63.5	64.0	64.7	60.8	62.3	63.5	63.3	63.6	52.5	53.2		0.59	0.61	0.64	0.48	0.53	0.58	0.60	0.61	0.26	0.28	0.52	0.14
5B5/3	37	61.6	64.0	63.0	64.3	65.6	66.0	65.2	65.5	54.2	55.5		0.52	0.61	0.57	0.61	0.66	0.67	0.67	0.68	0.31	0.35	0.56	0.14
5P5/3	38	60.0	61.5	61.7	67.3	68.1	67.2	61.8	63.8	52.5	54.0		0.47	0.52	0.53	0.73	0.77	0.73	0.55	0.63	0.26	0.31	0.55	0.17
N5	39	62.0	62.5	65.3	70.0	70.5	69.4	60.6	59.8	63.3	65.3		0.54	0.56	0.66	0.85	0.88	0.83	0.51	0.48	0.60	0.68	0.66	0.15

Table E-3a The border experimental data of subject YT at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	63.4	60.0	59.7	63.5	64.0	62.7	62.5	62.0	61.5	63.6		-0.23	-0.35	-0.36	-0.23	-0.21	-0.26	-0.26	-0.28	-0.31	-0.23	-0.27	0.05
10R4/10	2	63.6	63.0	64.1	61.5	60.1	60.0	59.5	61.5	62.1	63.2		-0.23	-0.25	-0.21	-0.31	-0.36	-0.36	-0.37	-0.30	-0.30	-0.25	-0.29	0.06
5YR5/10	3	56.5	57.4	58.0	57.6	59.8	58.8	53.2	54.0	57.0	56.2		-0.28	-0.25	-0.24	-0.25	-0.18	-0.21	-0.38	-0.35	-0.27	-0.30	-0.27	0.06
10YR5/10	4	50.5	54.0	53.0	53.5	54.1	52.2	49.8	51.5	51.0	49.1		-0.27	-0.17	-0.20	-0.19	-0.17	-0.23	-0.29	-0.24	-0.27	-0.32	-0.24	0.05
5Y7/10	5	47.5	46.6	46.0	47.0	46.5	44.8	45.0	42.5	45.0	44.1		-0.23	-0.25	-0.27	-0.24	-0.26	-0.30	-0.29	-0.36	-0.30	-0.33	-0.28	0.04
10Y7/10	6	50.0	49.5	50.0	46.8	46.0	46.5	47.2	44.0	50.5	48.0		-0.15	-0.17	-0.15	-0.24	-0.27	-0.25	-0.23	-0.32	-0.15	-0.22	-0.22	0.06
5GY6/9	7	54.0	53.5	52.1	57.5	55.0	52.1	51.0	50.2	55.1	56.0		-0.21	-0.22	-0.26	-0.11	-0.18	-0.26	-0.29	-0.31	-0.18	-0.16	-0.22	0.07
10GY6/10	8	54.0	51.5	50.8	56.0	54.5	54.5	55.0	52.2	57.1	56.5		-0.23	-0.30	-0.32	-0.17	-0.22	-0.22	-0.20	-0.28	-0.15	-0.17	-0.23	0.06
5G5/10	9	57.1	57.5	54.6	59.0	60.1	59.0	57.8	55.0	59.5	60.1		-0.34	-0.33	-0.41	-0.28	-0.25	-0.28	-0.31	-0.40	-0.27	-0.25	-0.31	0.06
10G5/10	10	57.5	58.5	56.1	58.0	58.5	57.6	58.1	58.0	61.0	60.0		-0.36	-0.33	-0.40	-0.35	-0.33	-0.36	-0.34	-0.34	-0.26	-0.29	-0.34	0.04
5BG4/9	11	67.0	65.2	65.0	62.5	61.0	63.1	62.0	60.0	67.0	66.0		-0.23	-0.31	-0.31	-0.41	-0.46	-0.39	-0.43	-0.50	-0.24	-0.28	-0.36	0.09
10BG4/9	12	67.5	65.5	65.0	66.5	65.3	67.3	62.8	62.0	65.0	67.7		-0.23	-0.31	-0.33	-0.27	-0.32	-0.24	-0.41	-0.44	-0.34	-0.23	-0.31	0.07
5B4/9	13	67.2	66.1	68.5	67.0	66.2	65.0	61.8	62.0	65.1	63.2		-0.25	-0.29	-0.19	-0.26	-0.29	-0.34	-0.45	-0.45	-0.34	-0.41	-0.33	0.09
10B4/10	14	66.4	67.0	63.8	62.6	63.5	65.6	67.6	68.9	66.1	66.4		-0.29	-0.26	-0.39	-0.44	-0.40	-0.32	-0.24	-0.18	-0.31	-0.30	-0.31	0.08
5PB4/10	15	66.2	66.0	65.6	65.5	66.1	65.3	62.8	64.0	66.5	66.0		-0.27	-0.28	-0.29	-0.30	-0.28	-0.31	-0.40	-0.35	-0.27	-0.29	-0.30	0.04
10PB4/10	16	65.2	65.0	63.1	67.5	67.0	65.1	65.2	62.0	65.5	63.5		-0.26	-0.27	-0.34	-0.17	-0.19	-0.27	-0.26	-0.38	-0.26	-0.34	-0.28	0.07
5P4/10	17	61.5	63.2	66.5	62.6	60.1	60.0	61.2	59.5	62.1	64.0		-0.37	-0.31	-0.18	-0.33	-0.42	-0.42	-0.38	-0.44	-0.36	-0.29	-0.35	0.08
10P4/10	18	64.7	66.1	65.0	62.6	62.0	64.6	61.5	63.0	62.5	64.0		-0.23	-0.18	-0.22	-0.31	-0.34	-0.24	-0.35	-0.30	-0.33	-0.27	-0.28	0.06
5RP4/10	19	63.1	61.5	63.8	62.9	64.0	62.1	64.0	62.0	66.0	65.5		-0.27	-0.32	-0.24	-0.28	-0.23	-0.31	-0.23	-0.30	-0.16	-0.18	-0.25	0.05
10RP4/10	20	59.3	57.8	61.0	62.0	60.6	62.5	63.4	61.0	63.0	63.5		-0.39	-0.44	-0.34	-0.30	-0.35	-0.29	-0.25	-0.34	-0.27	-0.26	-0.32	0.06
10RP3/8	21	65.0	66.5	65.2	66.8	67.0	67.5	67.5	67.0	68.0	68.0		-0.46	-0.40	-0.45	-0.41	-0.40	-0.38	-0.36	-0.38	-0.35	-0.35	-0.39	0.04
5R5/6	22	55.9	55.5	56.0	54.5	56.6	54.1	57.8	57.0	55.8	57.8		-0.30	-0.31	-0.29	-0.36	-0.30	-0.37	-0.24	-0.26	-0.31	-0.25	-0.30	0.04
10R3/4	23	67.1	67.0	66.8	68.1	67.0	66.5	63.6	67.0	64.5	63.5		-0.38	-0.38	-0.39	-0.36	-0.40	-0.42	-0.51	-0.38	-0.49	-0.53	-0.43	0.06
5YR5/6	24	57.5	56.6	57.6	56.5	56.0	54.1	54.9	55.5	59.0	58.5		-0.25	-0.28	-0.25	-0.30	-0.31	-0.37	-0.32	-0.31	-0.21	-0.23	-0.28	0.05
5Y5/6	25	57.4	59.5	59.5	56.5	57.1	56.7	59.5	57.0	59.0	56.5		-0.26	-0.20	-0.20	-0.31	-0.29	-0.30	-0.20	-0.27	-0.22	-0.30	-0.25	0.05
5Y4/6	26	64.5	63.9	65.5	63.5	61.2	62.4	61.0	63.0	62.0	64.6		-0.26	-0.28	-0.22	-0.32	-0.40	-0.36	-0.39	-0.32	-0.36	-0.27	-0.32	0.06
5GY5/6	27	55.0	59.0	60.0	60.2	60.0	60.5	60.0	59.7	60.5	61.5		-0.35	-0.23	-0.20	-0.22	-0.22	-0.21	-0.20	-0.21	-0.19	-0.16	-0.22	0.05
5G5/6	28	60.5	58.1	58.5	60.0	60.5	58.9	60.0	60.5	60.0	58.5		-0.22	-0.30	-0.29	-0.26	-0.24	-0.29	-0.24	-0.22	-0.25	-0.29	-0.26	0.03
5BG5/6	29	56.1	54.1	56.0	57.0	57.6	57.1	59.0	57.2	59.0	59.5		-0.38	-0.44	-0.39	-0.38	-0.36	-0.37	-0.29	-0.35	-0.31	-0.29	-0.36	0.05
5B5/6	30	57.5	56.5	56.8	57.1	57.0	58.4	57.5	57.0	60.0	56.4		-0.33	-0.35	-0.35	-0.36	-0.36	-0.32	-0.32	-0.34	-0.26	-0.37	-0.34	0.03
5PB5/6	31	55.5	56.6	53.7	59.1	59.0	55.5	58.0	57.2	61.0	57.8		-0.37	-0.34	-0.43	-0.29	-0.29	-0.39	-0.30	-0.32	-0.21	-0.32	-0.33	0.06
5P5/6	32	56.6	55.0	56.0	57.5	56.0	58.2	58.5	54.8	60.0	59.5		-0.31	-0.36	-0.33	-0.31	-0.35	-0.28	-0.25	-0.36	-0.22	-0.23	-0.30	0.05
5RP5/6	33	57.0	57.6	59.0	56.5	56.9	58.0	60.0	57.8	57.0	60.1		-0.27	-0.25	-0.21	-0.31	-0.29	-0.26	-0.18	-0.25	-0.28	-0.19	-0.25	0.04
5R5/3	34	57.0	58.8	57.0	57.5	58.1	57.2	57.4	56.5	60.5	57.5		-0.29	-0.24	-0.29	-0.30	-0.28	-0.31	-0.28	-0.31	-0.19	-0.29	-0.28	0.04
5Y5/3	35	61.5	59.2	58.5	58.1	58.8	58.0	58.5	58.0	56.4	59.4		-0.13	-0.21	-0.23	-0.27	-0.25	-0.27	-0.23	-0.25	-0.31	-0.22	-0.24	0.05
5G5/3	36	61.2	60.5	57.8	58.5	57.0	58.2	58.5	58.9	59.5	60.0		-0.18	-0.21	-0.29	-0.29	-0.34	-0.30	-0.27	-0.26	-0.25	-0.23	-0.26	0.05
5B5/3	37	60.2	60.5	58.5	60.0	60.5	58.4	59.0	57.8	60.0	59.5		-0.22	-0.21	-0.27	-0.25	-0.23	-0.30	-0.26	-0.29	-0.24	-0.25	-0.25	0.03
5P5/3	38	52.5	55.0	55.5	54.0	57.1	55.8	57.0	56.5	59.0	57.4		-0.45	-0.37	-0.35	-0.42	-0.33	-0.37	-0.31	-0.32	-0.26	-0.31	-0.35	0.05
N5	39	62.5	63.4	64.0	62.5	62.0	61.0	62.0	61.0	60.5	61.5		-0.13	-0.10	-0.08	-0.13	-0.15	-0.19	-0.15	-0.18	-0.21	-0.18	-0.15	0.04

Table E-3b The border experimental data of subject YT at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	63.3	62.8	62.5	66.7	65.5	64.9	66.0	66.1	66.9	66.9		0.35	0.33	0.32	0.49	0.44	0.42	0.48	0.48	0.50	0.50	0.43	0.07
10R4/10	2	66.2	66.6	67.5	69.8	70.0	68.3	68.6	68.2	68.0	67.8		0.46	0.47	0.51	0.62	0.63	0.55	0.58	0.56	0.54	0.53	0.55	0.06
5YR5/10	3	65.1	63.7	64.5	65.9	67.0	66.6	68.5	67.7	67.7	67.0		0.60	0.55	0.58	0.64	0.68	0.67	0.76	0.72	0.71	0.68	0.66	0.07
10YR5/10	4	57.0	61.3	59.8	60.3	60.1	59.5	63.1	62.5	64.1	63.2		0.50	0.64	0.59	0.61	0.60	0.58	0.72	0.70	0.75	0.71	0.64	0.08
5Y7/10	5	61.3	61.4	62.2	59.7	62.7	62.0	62.7	60.9	59.6	60.3		0.77	0.77	0.80	0.72	0.82	0.80	0.83	0.77	0.72	0.74	0.77	0.04
10Y7/10	6	59.6	62.0	62.0	62.2	64.1	61.8	67.4	67.0	63.2	62.8		0.71	0.80	0.80	0.81	0.88	0.79	1.02	1.01	0.85	0.83	0.85	0.10
5GY6/9	7	59.7	61.5	61.0	65.2	64.7	64.5	65.2	64.8	65.3	65.9		0.55	0.61	0.60	0.76	0.74	0.73	0.77	0.75	0.76	0.79	0.71	0.08
10GY6/10	8	57.0	58.6	58.4	60.8	62.5	63.1	64.8	64.5	65.6	65.6		0.44	0.49	0.48	0.57	0.63	0.65	0.73	0.71	0.75	0.75	0.62	0.12
5G5/10	9	59.7	60.6	61.2	60.7	60.7	61.3	63.2	63.2	68.1	67.8		0.33	0.36	0.38	0.37	0.37	0.39	0.47	0.47	0.66	0.64	0.44	0.12
10G5/10	10	65.3	64.6	66.4	67.5	68.2	68.0	70.7	68.5	63.9	64.3		0.50	0.47	0.54	0.59	0.62	0.62	0.75	0.65	0.45	0.47	0.57	0.10
5BG4/9	11	68.1	69.6	67.6	68.0	67.6	68.6	72.1	70.6	70.0	70.7		0.40	0.47	0.38	0.40	0.38	0.43	0.61	0.53	0.49	0.53	0.46	0.08
10BG4/9	12	68.3	67.7	68.7	70.4	70.3	68.7	69.3	69.3	68.7	68.1		0.39	0.37	0.41	0.49	0.49	0.42	0.45	0.45	0.42	0.39	0.43	0.04
5B4/9	13	68.9	69.5	69.6	68.5	70.0	70.4	71.1	72.3	70.6	72.0		0.41	0.44	0.45	0.40	0.47	0.49	0.53	0.59	0.50	0.57	0.49	0.06
10B4/10	14	70.3	68.0	69.5	70.5	69.3	69.9	73.0	73.2	69.5	71.4		0.47	0.37	0.43	0.49	0.43	0.46	0.62	0.63	0.44	0.53	0.49	0.09
5PB4/10	15	69.0	67.4	67.5	72.3	71.8	73.1	71.7	70.3	70.0	69.5		0.44	0.37	0.37	0.60	0.58	0.64	0.58	0.51	0.49	0.47	0.50	0.10
10PB4/10	16	65.0	65.4	65.2	66.8	66.0	66.4	70.0	71.2	69.5	70.1		0.31	0.33	0.32	0.39	0.36	0.38	0.54	0.60	0.51	0.54	0.43	0.11
5P4/10	17	63.8	65.6	67.5	66.5	68.4	68.3	67.8	67.5	67.8	69.3		0.30	0.37	0.45	0.41	0.49	0.49	0.48	0.47	0.47	0.54	0.45	0.07
10P4/10	18	66.2	67.8	67.7	70.1	69.8	69.5	71.0	71.3	72.5	71.8		0.41	0.48	0.48	0.59	0.57	0.56	0.64	0.66	0.71	0.67	0.58	0.10
5RP4/10	19	68.2	69.1	69.8	68.2	68.5	69.4	66.6	68.9	68.2	69.9		0.52	0.56	0.60	0.53	0.54	0.58	0.47	0.57	0.53	0.61	0.55	0.04
10RP4/10	20	63.9	65.0	66.1	70.1	68.3	68.0	65.1	65.2	66.7	66.7		0.36	0.40	0.44	0.62	0.54	0.53	0.42	0.42	0.47	0.47	0.47	0.08
10RP3/8	21	67.6	69.5	70.0	69.7	70.6	71.2	71.0	72.2	68.2	68.6		0.23	0.31	0.33	0.35	0.40	0.43	0.41	0.47	0.27	0.28	0.35	0.08
5R5/6	22	63.6	64.5	65.3	65.3	64.1	62.5	66.0	66.1	67.7	68.4		0.54	0.57	0.60	0.64	0.59	0.53	0.65	0.66	0.71	0.74	0.62	0.07
10R3/4	23	69.0	68.8	71.2	70.5	70.2	71.0	69.7	71.0	70.3	71.9		0.28	0.27	0.39	0.39	0.37	0.41	0.34	0.40	0.36	0.44	0.37	0.05
5YR5/6	24	63.0	64.2	64.6	64.5	67.1	67.3	67.8	66.4	67.6	67.0		0.51	0.56	0.57	0.61	0.71	0.72	0.73	0.67	0.71	0.68	0.65	0.08
5Y5/6	25	67.0	69.3	68.2	67.7	68.3	68.1	68.0	69.3	70.5	69.3		0.66	0.76	0.71	0.73	0.75	0.74	0.73	0.79	0.83	0.78	0.75	0.05
5Y4/6	26	70.1	69.6	71.8	69.3	69.6	70.4	69.8	70.8	70.6	71.2		0.55	0.53	0.64	0.55	0.57	0.61	0.56	0.61	0.59	0.62	0.58	0.04
5GY5/6	27	70.0	70.0	69.7	69.5	69.5	69.7	69.0	69.0	68.4	68.8		0.77	0.77	0.76	0.79	0.79	0.80	0.75	0.75	0.72	0.73	0.76	0.02
5G5/6	28	65.4	65.3	67.0	69.0	68.6	70.0	70.3	69.7	69.3	68.5		0.54	0.54	0.60	0.73	0.71	0.77	0.77	0.75	0.72	0.68	0.68	0.09
5BG5/6	29	63.7	65.3	67.5	70.6	70.3	68.5	68.7	69.7	67.6	69.2		0.45	0.51	0.60	0.78	0.76	0.68	0.68	0.72	0.62	0.69	0.65	0.11
5B5/6	30	67.2	67.4	67.5	68.0	67.3	66.6	70.5	70.0	71.2	70.7		0.60	0.61	0.62	0.67	0.64	0.61	0.77	0.75	0.80	0.78	0.69	0.08
5PB5/6	31	68.0	69.2	68.5	66.8	64.7	64.4	68.8	69.0	70.1	70.1		0.65	0.70	0.67	0.63	0.55	0.54	0.71	0.72	0.76	0.76	0.67	0.08
5P5/6	32	63.8	64.6	64.5	68.8	66.2	65.9	67.3	69.1	69.2	70.3		0.51	0.54	0.53	0.75	0.64	0.63	0.67	0.75	0.75	0.80	0.66	0.10
5RP5/6	33	64.0	64.2	63.8	68.3	67.5	66.7	68.1	68.7	68.7	69.0		0.54	0.55	0.54	0.76	0.72	0.69	0.73	0.76	0.75	0.77	0.68	0.10
5R5/3	34	63.6	63.1	66.2	68.7	68.5	67.0	66.0	66.4	66.4	64.9		0.51	0.49	0.61	0.75	0.74	0.68	0.62	0.64	0.63	0.57	0.62	0.09
5Y5/3	35	67.0	67.1	68.8	68.5	68.1	66.3	70.6	70.7	69.8	69.5		0.66	0.66	0.73	0.76	0.74	0.66	0.84	0.85	0.79	0.78	0.75	0.07
5G5/3	36	68.9	69.3	69.5	69.5	68.7	71.1	71.1	70.9	70.4	71.3		0.70	0.72	0.73	0.77	0.73	0.84	0.83	0.82	0.79	0.83	0.78	0.05
5B5/3	37	66.7	68.1	69.6	66.0	68.2	67.8	67.3	70.0	64.4	66.7		0.60	0.66	0.73	0.61	0.70	0.69	0.65	0.77	0.53	0.62	0.66	0.07
5P5/3	38	67.8	65.7	65.1	65.3	65.0	65.0	66.9	67.3	68.7	69.5		0.66	0.57	0.55	0.59	0.58	0.58	0.64	0.66	0.71	0.75	0.63	0.07
N5	39	63.0	59.8	62.4	65.8	68.8	68.0	69.1	69.3	70.2	70.7		0.47	0.36	0.45	0.59	0.71	0.68	0.74	0.75	0.78	0.80	0.63	0.16

Table E-4a The border experimental data of subject WR at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	65.7	64.9	65.0	60.3	60.7	61.1	63.0	62.2	64.3	62.5		-0.13	-0.17	-0.16	-0.33	-0.32	-0.30	-0.23	-0.26	-0.18	-0.25	-0.23	0.07
10R4/10	2	64.8	63.1	64.2	63.0	62.1	64.1	62.7	63.5	65.0	63.5		-0.18	-0.24	-0.20	-0.24	-0.28	-0.20	-0.25	-0.22	-0.16	-0.22	-0.22	0.03
5YR5/10	3	61.6	59.4	60.2	57.7	56.0	55.5	60.5	59.5	60.9	59.7		-0.11	-0.19	-0.16	-0.24	-0.28	-0.30	-0.14	-0.17	-0.13	-0.17	-0.19	0.06
10YR5/10	4	56.0	55.2	53.4	53.0	51.5	53.7	67.6	66.6	57.8	60.7		-0.11	-0.13	-0.19	-0.19	-0.24	-0.17	0.31	0.27	-0.05	0.05	-0.04	0.19
5Y7/10	5	49.9	50.3	49.6	50.2	49.5	49.3	50.1	48.6	49.5	48.7		-0.16	-0.14	-0.16	-0.14	-0.16	-0.17	-0.14	-0.18	-0.16	-0.18	-0.16	0.01
10Y7/10	6	47.7	48.2	47.5	49.9	53.4	49.7	49.5	48.3	48.4	47.9		-0.21	-0.20	-0.22	-0.15	-0.05	-0.15	-0.15	-0.18	-0.18	-0.20	-0.17	0.05
5GY6/9	7	52.6	52.5	53.2	53.6	53.1	53.5	53.6	53.6	52.7	52.6		-0.24	-0.25	-0.22	-0.21	-0.22	-0.21	-0.20	-0.20	-0.23	-0.23	-0.22	0.02
10GY6/10	8	54.2	52.1	54.3	53.5	53.5	53.0	54.9	55.6	54.8	54.3		-0.22	-0.28	-0.22	-0.24	-0.24	-0.25	-0.19	-0.17	-0.19	-0.21	-0.22	0.03
5G5/10	9	59.2	57.2	56.7	59.1	58.5	58.1	60.3	59.7	59.0	58.3		-0.27	-0.33	-0.34	-0.27	-0.29	-0.30	-0.22	-0.24	-0.26	-0.28	-0.28	0.04
10G5/10	10	59.2	58.1	57.4	59.3	57.8	58.6	59.8	60.0	58.2	59.1		-0.30	-0.34	-0.36	-0.29	-0.34	-0.32	-0.27	-0.27	-0.32	-0.29	-0.31	0.03
5BG4/9	11	64.6	63.0	64.2	65.0	64.8	65.8	67.0	67.2	64.6	63.5		-0.32	-0.38	-0.34	-0.31	-0.31	-0.27	-0.22	-0.21	-0.31	-0.35	-0.30	0.06
10BG4/9	12	65.6	65.5	64.4	65.2	65.5	66.7	67.0	65.8	66.4	66.7		-0.30	-0.31	-0.35	-0.31	-0.30	-0.25	-0.23	-0.28	-0.26	-0.25	-0.28	0.04
5B4/9	13	65.0	64.3	64.2	64.1	65.3	63.3	66.7	66.6	66.3	65.3		-0.33	-0.36	-0.36	-0.36	-0.31	-0.39	-0.25	-0.25	-0.27	-0.31	-0.32	0.05
10B4/10	14	61.7	62.5	61.2	65.2	63.5	62.5	66.5	65.8	65.5	65.5		-0.46	-0.43	-0.48	-0.33	-0.39	-0.43	-0.27	-0.29	-0.31	-0.31	-0.37	0.08
5PB4/10	15	62.8	63.2	64.8	64.6	65.2	65.0	68.0	67.1	65.3	67.5		-0.40	-0.38	-0.32	-0.32	-0.30	-0.31	-0.18	-0.22	-0.29	-0.20	-0.29	0.07
10PB4/10	16	61.3	63.3	64.4	66.0	64.0	64.0	66.5	66.9	66.8	66.0		-0.40	-0.33	-0.29	-0.22	-0.30	-0.30	-0.20	-0.18	-0.18	-0.22	-0.26	0.07
5P4/10	17	65.0	63.2	61.3	63.4	63.4	64.5	64.7	64.8	65.5	64.5		-0.23	-0.30	-0.37	-0.29	-0.29	-0.25	-0.23	-0.23	-0.20	-0.24	-0.26	0.05
10P4/10	18	62.5	60.0	62.7	63.5	65.6	65.8	64.5	65.5	64.3	66.5		-0.31	-0.40	-0.30	-0.27	-0.19	-0.18	-0.22	-0.18	-0.23	-0.14	-0.24	0.08
5RP4/10	19	64.0	62.2	61.0	63.5	63.3	63.5	62.2	64.5	65.6	64.3		-0.23	-0.29	-0.34	-0.24	-0.25	-0.24	-0.28	-0.20	-0.15	-0.20	-0.24	0.05
10RP4/10	20	61.5	63.2	61.5	64.4	63.6	62.7	63.4	62.4	65.3	64.7		-0.31	-0.25	-0.31	-0.20	-0.23	-0.27	-0.23	-0.27	-0.16	-0.18	-0.24	0.05
10RP3/8	21	69.3	69.2	68.7	70.7	69.6	69.5	69.5	68.0	69.3	69.5		-0.28	-0.28	-0.30	-0.20	-0.26	-0.26	-0.25	-0.32	-0.26	-0.25	-0.27	0.03
5R5/6	22	58.9	60.3	59.5	63.5	61.2	61.2	57.5	59.0	61.1	59.8		-0.21	-0.16	-0.19	-0.04	-0.12	-0.12	-0.23	-0.19	-0.12	-0.16	-0.15	0.06
10R3/4	23	69.5	71.3	70.5	70.5	71.4	72.0	71.4	71.3	70.3	71.1		-0.27	-0.18	-0.22	-0.22	-0.17	-0.14	-0.16	-0.17	-0.22	-0.18	-0.19	0.04
5YR5/6	24	60.7	59.0	59.2	63.1	60.6	63.0	60.0	59.2	63.6	61.7		-0.15	-0.20	-0.20	-0.05	-0.14	-0.06	-0.16	-0.18	-0.03	-0.10	-0.13	0.06
5Y5/6	25	60.0	59.5	59.4	59.4	60.8	61.2	61.5	62.2	61.6	61.7		-0.18	-0.20	-0.20	-0.19	-0.14	-0.13	-0.11	-0.09	-0.11	-0.11	-0.15	0.04
5Y4/6	26	68.5	68.5	68.3	67.9	66.5	67.8	68.9	68.0	69.5	68.0		-0.09	-0.09	-0.10	-0.11	-0.17	-0.12	-0.06	-0.10	-0.04	-0.10	-0.10	0.04
5GY5/6	27	58.5	57.7	61.8	61.0	61.5	60.5	61.3	60.0	60.6	60.4		-0.25	-0.27	-0.14	-0.16	-0.14	-0.18	-0.14	-0.19	-0.16	-0.17	-0.18	0.05
5G5/6	28	56.5	59.5	60.2	59.8	60.0	59.7	58.3	58.5	59.3	60.0		-0.34	-0.25	-0.23	-0.24	-0.23	-0.24	-0.28	-0.27	-0.24	-0.22	-0.25	0.04
5BG5/6	29	59.7	56.6	57.2	59.0	58.9	59.2	60.2	59.9	60.4	59.0		-0.27	-0.37	-0.35	-0.29	-0.29	-0.28	-0.24	-0.25	-0.23	-0.28	-0.29	0.04
5B5/6	30	60.1	60.0	60.3	59.9	59.5	60.1	59.9	60.7	61.3	60.1		-0.24	-0.25	-0.24	-0.24	-0.25	-0.24	-0.24	-0.21	-0.19	-0.23	-0.23	0.02
5PB5/6	31	62.3	61.2	60.1	60.5	59.8	59.7	59.0	58.5	60.4	59.4		-0.16	-0.19	-0.23	-0.21	-0.24	-0.24	-0.25	-0.27	-0.21	-0.24	-0.22	0.03
5P5/6	32	58.9	58.0	59.5	59.7	58.6	59.1	60.6	59.0	59.5	61.0		-0.24	-0.27	-0.22	-0.21	-0.24	-0.23	-0.17	-0.22	-0.21	-0.16	-0.22	0.03
5RP5/6	33	61.0	60.3	60.3	58.8	60.7	60.3	61.3	60.0	63.1	60.0		-0.14	-0.17	-0.17	-0.21	-0.15	-0.16	-0.12	-0.16	-0.05	-0.16	-0.15	0.04
5R5/3	34	60.0	62.2	60.8	62.5	61.7	60.9	60.0	59.8	61.5	61.3		-0.20	-0.12	-0.17	-0.10	-0.13	-0.16	-0.19	-0.19	-0.13	-0.14	-0.15	0.03
5Y5/3	35	61.2	60.5	60.3	61.2	60.5	61.6	62.9	60.5	62.4	60.0		-0.14	-0.17	-0.18	-0.14	-0.16	-0.12	-0.07	-0.15	-0.09	-0.17	-0.14	0.04
5G5/3	36	59.0	59.5	59.8	60.7	59.0	61.0	58.4	58.5	60.7	59.4		-0.25	-0.24	-0.23	-0.19	-0.24	-0.18	-0.26	-0.25	-0.18	-0.23	-0.22	0.03
5B5/3	37	59.6	59.6	58.9	59.7	60.0	60.3	59.6	60.7	60.5	60.5		-0.24	-0.24	-0.26	-0.23	-0.22	-0.21	-0.22	-0.19	-0.19	-0.19	-0.22	0.02
5P5/3	38	61.8	60.7	61.0	59.7	59.5	61.1	60.5	60.3	60.8	62.7		-0.15	-0.19	-0.18	-0.22	-0.23	-0.17	-0.19	-0.19	-0.18	-0.11	-0.18	0.03
N5	39	66.2	65.6	64.0	62.3	66.5	63.7	63.2	61.2	62.0	61.6		0.02	-0.01	-0.07	-0.13	0.03	-0.08	-0.09	-0.16	-0.13	-0.15	-0.08	0.07

Table E-4b The border experimental data of subject WR at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	58.0	58.5	66.5	66.2	66.0	66.1	66.2	66.5	68.5	66.5		0.28	0.29	0.54	0.53	0.52	0.52	0.53	0.54	0.61	0.52	0.49	0.11
10R4/10	2	57.6	59.0	68.6	68.7	67.4	67.0	66.0	65.5	67.5	70.0		0.26	0.30	0.62	0.63	0.56	0.55	0.51	0.49	0.55	0.67	0.51	0.14
5YR5/10	3	57.0	56.8	64.9	64.2	62.6	64.7	65.5	65.8	66.5	65.0		0.42	0.42	0.66	0.63	0.56	0.64	0.68	0.69	0.70	0.64	0.60	0.10
10YR5/10	4	52.0	52.8	59.5	57.9	62.8	61.5	61.9	61.5	64.0	63.5		0.46	0.48	0.64	0.59	0.75	0.70	0.72	0.71	0.78	0.76	0.66	0.11
5Y7/10	5	46.5	46.6	59.4	57.8	58.9	57.0	60.0	57.0	58.5	59.0		0.44	0.44	0.77	0.72	0.75	0.69	0.78	0.69	0.72	0.73	0.67	0.13
10Y7/10	6	50.6	49.5	57.6	55.3	57.4	59.3	59.0	56.5	60.0	60.5		0.55	0.52	0.72	0.65	0.70	0.76	0.75	0.68	0.77	0.79	0.69	0.09
5GY6/9	7	52.1	53.5	60.1	59.7	62.0	60.0	60.5	61.3	60.5	59.5		0.43	0.47	0.63	0.62	0.69	0.62	0.64	0.67	0.62	0.59	0.60	0.08
10GY6/10	8	54.9	53.5	63.0	62.5	63.6	59.7	64.0	64.0	63.5	64.0		0.49	0.44	0.71	0.69	0.72	0.58	0.74	0.74	0.70	0.72	0.65	0.11
5G5/10	9	59.2	56.5	62.6	60.9	66.5	66.0	67.0	68.0	66.0	66.5		0.42	0.34	0.49	0.43	0.64	0.62	0.66	0.70	0.60	0.62	0.55	0.12
10G5/10	10	58.4	57.3	67.0	65.7	66.2	64.5	69.2	68.5	68.0	67.5		0.36	0.32	0.63	0.58	0.59	0.53	0.72	0.69	0.65	0.63	0.57	0.13
5BG4/9	11	62.5	62.6	70.6	70.8	70.9	68.8	69.6	72.0	66.0	67.0		0.28	0.28	0.58	0.59	0.59	0.49	0.53	0.64	0.36	0.40	0.47	0.13
10BG4/9	12	62.4	64.5	71.6	68.0	71.1	70.3	70.5	71.0	70.6	71.5		0.26	0.34	0.61	0.44	0.58	0.54	0.55	0.58	0.54	0.58	0.50	0.12
5B4/9	13	60.5	63.2	70.5	69.8	70.9	71.5	69.8	69.1	68.5	68.0		0.19	0.29	0.55	0.52	0.57	0.60	0.51	0.48	0.44	0.42	0.46	0.13
10B4/10	14	62.2	63.0	69.0	70.1	69.7	67.8	70.9	70.7	69.0	70.0		0.24	0.27	0.48	0.53	0.50	0.42	0.56	0.55	0.45	0.50	0.45	0.11
5PB4/10	15	66.6	61.9	69.7	68.6	68.5	68.4	69.4	69.4	70.5	70.0		0.44	0.26	0.53	0.48	0.47	0.47	0.51	0.51	0.55	0.52	0.48	0.08
10PB4/10	16	63.0	63.2	68.5	69.6	66.5	66.0	69.5	70.5	69.5	68.5		0.34	0.35	0.52	0.57	0.43	0.41	0.56	0.61	0.55	0.50	0.49	0.10
5P4/10	17	61.3	61.5	66.9	66.6	68.5	66.6	69.0	67.4	65.5	65.0		0.31	0.32	0.49	0.48	0.55	0.47	0.58	0.50	0.41	0.39	0.45	0.09
10P4/10	18	57.6	57.0	64.9	63.6	66.5	67.6	68.0	67.8	68.5	68.5		0.21	0.19	0.43	0.38	0.48	0.53	0.55	0.54	0.55	0.55	0.44	0.14
5RP4/10	19	56.5	54.2	68.7	68.4	68.9	68.0	69.0	69.6	68.8	69.0		0.21	0.14	0.61	0.60	0.61	0.57	0.62	0.65	0.59	0.60	0.52	0.18
10RP4/10	20	54.0	57.2	67.1	67.2	66.9	67.0	69.0	69.2	66.0	66.0		0.14	0.23	0.55	0.55	0.53	0.54	0.63	0.63	0.48	0.48	0.48	0.16
10RP3/8	21	57.2	58.5	67.1	69.8	71.6	72.6	71.2	72.0	66.9	67.8		-0.04	0.00	0.28	0.39	0.48	0.53	0.46	0.50	0.25	0.28	0.31	0.20
5R5/6	22	55.6	55.4	60.5	61.4	65.9	66.9	66.5	65.6	64.4	64.8		0.39	0.38	0.49	0.53	0.69	0.73	0.72	0.68	0.62	0.63	0.58	0.13
10R3/4	23	66.4	67.2	69.6	71.3	74.1	75.0	87.5	87.0	76.6	78.0		0.28	0.32	0.38	0.46	0.60	0.65	0.68	0.68	0.64	0.65	0.54	0.16
5YR5/6	24	51.5	50.6	65.3	63.4	68.5	67.2	68.0	67.5	67.0	67.7		0.26	0.24	0.67	0.60	0.80	0.74	0.78	0.76	0.72	0.75	0.63	0.21
5Y5/6	25	56.4	57.0	59.7	60.0	65.8	66.5	67.4	67.1	62.1	63.5		0.40	0.42	0.46	0.47	0.68	0.71	0.74	0.73	0.52	0.57	0.57	0.14
5Y4/6	26	61.4	63.1	69.6	68.4	72.6	72.1	72.5	72.2	69.4	70.1		0.31	0.38	0.60	0.55	0.74	0.72	0.74	0.73	0.57	0.60	0.60	0.15
5GY5/6	27	61.5	58.9	66.3	65.3	68.1	67.1	68.5	68.8	65.4	64.4		0.54	0.45	0.68	0.64	0.75	0.71	0.77	0.79	0.63	0.59	0.66	0.11
5G5/6	28	59.3	57.9	65.6	65.4	67.0	67.5	66.4	67.0	66.7	66.0		0.43	0.39	0.62	0.61	0.67	0.69	0.65	0.67	0.64	0.61	0.60	0.10
5BG5/6	29	57.4	56.7	65.4	63.3	67.9	66.6	66.5	66.3	64.7	65.6		0.34	0.32	0.58	0.50	0.68	0.63	0.63	0.62	0.54	0.57	0.54	0.12
5B5/6	30	58.4	55.0	62.1	63.8	67.4	66.4	68.0	69.0	67.2	66.8		0.39	0.29	0.48	0.54	0.68	0.64	0.70	0.75	0.65	0.64	0.58	0.15
5PB5/6	31	60.4	59.7	61.5	65.0	68.4	68.4	68.0	68.5	67.4	67.0		0.47	0.44	0.46	0.59	0.73	0.73	0.71	0.74	0.67	0.65	0.62	0.12
5P5/6	32	57.0	57.0	59.7	60.0	67.5	66.5	66.0	66.3	65.1	63.0		0.39	0.39	0.43	0.44	0.72	0.68	0.66	0.67	0.61	0.53	0.55	0.13
5RP5/6	33	54.0	56.6	60.5	60.5	64.5	64.5	65.5	65.0	62.1	61.3		0.33	0.41	0.49	0.49	0.63	0.63	0.67	0.65	0.52	0.50	0.53	0.11
5R5/3	34	54.0	55.4	62.5	64.9	67.6	66.0	66.7	66.2	61.9	63.0		0.31	0.35	0.54	0.63	0.73	0.67	0.70	0.68	0.49	0.53	0.56	0.14
5Y5/3	35	52.2	51.0	64.5	63.5	65.1	66.1	67.0	67.0	61.7	61.9		0.27	0.24	0.63	0.59	0.64	0.68	0.72	0.72	0.50	0.51	0.55	0.17
5G5/3	36	57.4	57.5	65.6	64.4	64.7	65.5	68.0	68.3	64.0	62.2		0.39	0.39	0.63	0.59	0.59	0.62	0.73	0.74	0.55	0.48	0.57	0.12
5B5/3	37	57.5	58.9	61.5	64.6	67.5	67.0	69.0	68.5	68.0	68.3		0.39	0.43	0.48	0.59	0.70	0.68	0.77	0.75	0.71	0.72	0.62	0.14
5P5/3	38	56.2	56.9	63.0	64.7	66.0	65.1	68.5	67.2	64.7	65.1		0.36	0.38	0.54	0.60	0.65	0.61	0.76	0.70	0.58	0.60	0.58	0.13
N5	39	58.0	58.5	65.0	65.5	66.9	66.0	68.5	68.5	66.5	65.5		0.41	0.42	0.61	0.63	0.68	0.65	0.76	0.76	0.65	0.61	0.62	0.12

Table E-5a The brightness matching experimental data of subject MI at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	52.2	52.5	53.5	48.7	50.8	52.2	49.1	49.1	51.6	50.3		-0.51	-0.50	-0.47	-0.62	-0.57	-0.53	-0.63	-0.63	-0.56	-0.60	-0.56	0.06
10R4/10	2	53.6	52.3	54.0	54.6	54.8	55.2	55.5	56.1	52.1	55.2		-0.48	-0.52	-0.47	-0.46	-0.46	-0.44	-0.45	-0.44	-0.55	-0.46	-0.47	0.04
5YR5/10	3	48.5	48.3	48.5	47.6	48.5	50.2	48.1	47.4	48.6	47.3		-0.44	-0.44	-0.44	-0.48	-0.45	-0.40	-0.48	-0.50	-0.47	-0.50	-0.46	0.03
10YR5/10	4	48.2	46.2	46.4	45.6	46.4	45.5	43.8	44.4	47.5	43.5		-0.27	-0.32	-0.31	-0.35	-0.33	-0.35	-0.42	-0.40	-0.32	-0.42	-0.35	0.05
5Y7/10	5	39.7	38.5	38.3	39.2	38.5	40.3	40.5	39.5	42.3	42.2		-0.36	-0.39	-0.40	-0.39	-0.41	-0.36	-0.37	-0.40	-0.33	-0.33	-0.37	0.03
10Y7/10	6	40.6	40.2	39.3	42.2	42.2	42.7	41.8	41.7	44.3	42.2		-0.34	-0.35	-0.37	-0.31	-0.31	-0.29	-0.34	-0.34	-0.27	-0.32	-0.32	0.03
5GY6/9	7	45.3	45.2	45.3	48.8	47.7	48.3	47.5	46.7	48.1	48.0		-0.38	-0.38	-0.38	-0.30	-0.33	-0.31	-0.35	-0.37	-0.33	-0.33	-0.34	0.03
10GY6/10	8	47.7	46.3	46.1	45.2	47.5	45.7	45.2	42.1	47.2	48.2		-0.34	-0.38	-0.38	-0.42	-0.36	-0.41	-0.44	-0.52	-0.38	-0.35	-0.40	0.05
5G5/10	9	48.7	52.3	51.2	51.2	52.7	54.2	51.7	52.8	52.1	50.8		-0.51	-0.41	-0.44	-0.45	-0.41	-0.36	-0.45	-0.42	-0.44	-0.48	-0.44	0.04
10G5/10	10	52.5	50.5	53.6	51.2	53.9	53.6	51.1	52.6	51.6	51.9		-0.44	-0.49	-0.40	-0.49	-0.41	-0.42	-0.51	-0.46	-0.49	-0.48	-0.46	0.04
5BG4/9	11	58.1	58.5	59.5	61.6	59.7	60.2	61.2	59.8	60.1	58.3		-0.48	-0.47	-0.44	-0.38	-0.45	-0.43	-0.41	-0.46	-0.45	-0.51	-0.45	0.04
10BG4/9	12	59.3	61.5	61.2	59.5	58.7	60.7	63.4	61.7	57.7	59.5		-0.46	-0.39	-0.40	-0.47	-0.50	-0.43	-0.35	-0.41	-0.54	-0.49	-0.45	0.06
5B4/9	13	61.5	61.7	62.1	57.6	59.5	59.8	57.7	60.5	60.5	60.9		-0.39	-0.39	-0.37	-0.54	-0.48	-0.47	-0.55	-0.46	-0.46	-0.45	-0.45	0.06
10B4/10	14	61.2	63.5	62.5	60.1	60.4	60.3	59.2	61.5	57.9	58.8		-0.41	-0.33	-0.37	-0.46	-0.45	-0.46	-0.51	-0.43	-0.55	-0.52	-0.45	0.07
5PB4/10	15	60.2	61.4	63.6	58.1	60.8	61.6	60.7	61.1	59.9	62.5		-0.42	-0.38	-0.30	-0.50	-0.42	-0.39	-0.44	-0.42	-0.46	-0.37	-0.41	0.06
10PB4/10	16	61.1	60.7	62.3	60.4	61.6	61.4	59.5	60.1	61.2	62.5		-0.34	-0.36	-0.30	-0.38	-0.34	-0.35	-0.43	-0.41	-0.37	-0.33	-0.36	0.04
5P4/10	17	58.3	59.5	57.5	58.3	58.5	60.2	59.3	58.6	59.7	60.1		-0.40	-0.37	-0.43	-0.42	-0.41	-0.36	-0.40	-0.42	-0.39	-0.38	-0.40	0.02
10P4/10	18	55.0	56.2	58.6	57.6	57.4	56.1	53.4	56.4	56.5	57.3		-0.48	-0.45	-0.38	-0.42	-0.43	-0.46	-0.56	-0.47	-0.47	-0.45	-0.46	0.05
5RP4/10	19	53.6	53.5	55.2	52.1	54.1	56.2	53.6	54.1	54.9	55.5		-0.50	-0.50	-0.45	-0.56	-0.50	-0.43	-0.53	-0.51	-0.49	-0.47	-0.49	0.04
10RP4/10	20	51.7	54.1	54.4	55.6	55.2	53.2	52.2	54.3	53.2	54.2		-0.55	-0.48	-0.47	-0.45	-0.46	-0.52	-0.56	-0.50	-0.54	-0.50	-0.50	0.04
10RP3/8	21	61.2	61.3	61.1	58.9	60.0	61.5	59.7	61.6	61.6	61.1		-0.53	-0.52	-0.53	-0.62	-0.58	-0.53	-0.61	-0.55	-0.55	-0.56	-0.56	0.03
5R5/6	22	49.5	50.1	50.0	49.7	51.5	50.9	51.9	50.8	50.8	51.5		-0.41	-0.39	-0.40	-0.42	-0.37	-0.39	-0.37	-0.40	-0.40	-0.39	-0.39	0.02
10R3/4	23	61.9	63.4	62.5	64.1	63.2	65.6	62.6	63.7	64.7	65.9		-0.51	-0.45	-0.49	-0.44	-0.47	-0.38	-0.51	-0.47	-0.43	-0.39	-0.45	0.05
5YR5/6	24	50.7	50.3	50.5	46.5	48.5	49.7	50.1	50.0	50.6	50.6		-0.38	-0.39	-0.38	-0.51	-0.45	-0.42	-0.42	-0.43	-0.41	-0.41	-0.42	0.04
5Y5/6	25	53.7	53.0	55.5	54.8	54.4	53.6	54.1	54.7	54.2	55.0		-0.30	-0.32	-0.24	-0.28	-0.29	-0.32	-0.32	-0.30	-0.31	-0.29	-0.30	0.02
5Y4/6	26	60.5	59.7	60.2	59.1	59.6	58.7	58.2	59.3	58.7	59.2		-0.34	-0.36	-0.35	-0.40	-0.38	-0.41	-0.44	-0.41	-0.42	-0.41	-0.39	0.03
5GY5/6	27	54.9	56.8	55.6	54.3	55.4	55.6	55.4	55.3	54.7	54.8		-0.28	-0.23	-0.26	-0.31	-0.28	-0.28	-0.30	-0.30	-0.32	-0.32	-0.29	0.03
5G5/6	28	52.5	53.6	53.8	52.6	53.1	52.5	51.7	52.7	52.3	54.5		-0.39	-0.36	-0.35	-0.40	-0.39	-0.41	-0.45	-0.42	-0.43	-0.36	-0.40	0.03
5BG5/6	29	53.8	53.5	53.2	54.1	52.8	54.5	53.7	55.6	55.1	52.8		-0.38	-0.39	-0.40	-0.38	-0.42	-0.37	-0.41	-0.36	-0.37	-0.44	-0.39	0.03
5B5/6	30	54.5	54.4	54.6	52.2	51.6	52.6	54.1	52.1	54.5	54.2		-0.34	-0.34	-0.34	-0.42	-0.44	-0.41	-0.38	-0.44	-0.37	-0.38	-0.39	0.04
5PB5/6	31	56.4	57.5	56.5	56.2	57.5	56.6	57.4	58.1	56.7	56.8		-0.28	-0.24	-0.27	-0.30	-0.26	-0.28	-0.28	-0.26	-0.30	-0.30	-0.28	0.02
5P5/6	32	54.9	54.5	55.1	54.5	55.6	54.2	53.6	52.7	54.1	55.5		-0.29	-0.30	-0.28	-0.31	-0.28	-0.32	-0.36	-0.39	-0.34	-0.30	-0.32	0.04
5RP5/6	33	52.0	51.1	51.5	50.6	50.3	52.9	51.3	49.9	50.8	50.2		-0.35	-0.37	-0.36	-0.40	-0.41	-0.33	-0.40	-0.43	-0.41	-0.43	-0.39	0.03
5R5/3	34	51.5	52.3	53.2	51.2	52.6	52.7	51.8	53.0	54.2	54.7		-0.38	-0.36	-0.33	-0.41	-0.37	-0.36	-0.41	-0.37	-0.33	-0.32	-0.36	0.03
5Y5/3	35	56.5	56.4	55.3	53.6	55.2	54.6	54.7	55.8	55.3	54.7		-0.22	-0.22	-0.26	-0.32	-0.27	-0.29	-0.30	-0.27	-0.29	-0.30	-0.28	0.03
5G5/3	36	56.3	53.5	54.3	55.2	55.5	55.6	57.5	57.8	54.5	55.3		-0.26	-0.35	-0.32	-0.31	-0.30	-0.30	-0.26	-0.25	-0.35	-0.32	-0.30	0.03
5B5/3	37	55.5	55.7	56.2	54.3	55.2	55.5	55.2	56.1	54.1	57.3		-0.29	-0.28	-0.27	-0.34	-0.31	-0.30	-0.33	-0.30	-0.36	-0.27	-0.31	0.03
5P5/3	38	54.9	55.4	54.7	54.8	55.3	56.1	54.1	55.3	54.3	55.2		-0.30	-0.29	-0.31	-0.32	-0.30	-0.28	-0.36	-0.32	-0.35	-0.32	-0.31	0.02
N5	39	56.1	57.2	56.5	55.7	56.2	56.2	55.7	55.9	54.7	57.3		-0.27	-0.23	-0.25	-0.29	-0.28	-0.28	-0.31	-0.30	-0.34	-0.26	-0.28	0.03

Table E-5b The brightness matching experimental data of subject MI at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	58.4	58.2	58.5	56.0	59.5	59.0	60.0	58.4	59.5	58.0		0.23	0.23	0.24	0.16	0.27	0.25	0.28	0.23	0.27	0.22	0.24	0.03
10R4/10	2	59.5	61.5	59.8	59.9	57.0	60.4	56.4	60.0	63.4	62.2		0.27	0.34	0.28	0.29	0.20	0.30	0.18	0.29	0.41	0.37	0.29	0.07
5YR5/10	3	57.0	55.4	57.5	56.5	56.8	57.2	54.0	56.0	53.0	53.1		0.39	0.34	0.40	0.38	0.38	0.40	0.30	0.36	0.27	0.27	0.35	0.05
10YR5/10	4	53.5	51.2	51.9	53.5	54.2	52.2	53.5	53.0	52.0	50.9		0.46	0.39	0.41	0.46	0.48	0.42	0.46	0.44	0.41	0.38	0.43	0.03
5Y7/10	5	48.2	49.5	48.9	47.0	46.5	47.5	50.5	49.0	48.1	47.8		0.45	0.49	0.47	0.42	0.40	0.43	0.51	0.47	0.45	0.44	0.45	0.03
10Y7/10	6	51.8	49.0	50.5	50.5	49.2	49.2	47.4	49.2	49.5	47.0		0.55	0.48	0.52	0.52	0.48	0.48	0.43	0.48	0.49	0.42	0.48	0.04
5GY6/9	7	54.5	58.0	57.5	56.0	57.0	57.2	54.5	56.0	55.8	57.0		0.46	0.56	0.55	0.50	0.53	0.54	0.46	0.50	0.50	0.53	0.51	0.03
10GY6/10	8	59.0	56.5	56.5	55.5	55.2	52.5	56.1	55.0	54.4	54.0		0.57	0.49	0.49	0.47	0.46	0.37	0.48	0.45	0.43	0.42	0.46	0.05
5G5/10	9	67.0	61.0	61.9	62.0	62.2	61.5	54.2	57.0	60.0	58.2		0.66	0.44	0.47	0.47	0.48	0.45	0.23	0.31	0.40	0.34	0.43	0.12
10G5/10	10	59.9	57.8	60.2	63.1	61.0	63.2	57.0	57.0	57.1	56.0		0.38	0.31	0.39	0.49	0.42	0.49	0.29	0.29	0.29	0.26	0.36	0.09
5BG4/9	11	66.0	66.8	67.0	64.9	63.4	64.5	65.0	67.1	66.4	64.2		0.37	0.40	0.41	0.33	0.27	0.31	0.33	0.42	0.39	0.30	0.35	0.05
10BG4/9	12	65.2	61.9	65.5	70.0	70.5	70.2	61.8	62.5	64.4	65.5		0.32	0.20	0.34	0.53	0.55	0.54	0.20	0.22	0.29	0.34	0.35	0.14
5B4/9	13	69.2	70.4	71.2	68.5	70.0	70.1	65.2	66.0	66.0	66.8		0.49	0.54	0.58	0.45	0.52	0.53	0.32	0.35	0.35	0.38	0.45	0.09
10B4/10	14	68.5	67.0	68.0	68.0	69.1	69.4	69.5	68.0	66.4	65.0		0.46	0.40	0.44	0.44	0.49	0.50	0.50	0.44	0.37	0.31	0.43	0.06
5PB4/10	15	70.0	69.5	69.2	69.0	68.4	70.5	66.5	68.0	68.0	66.2		0.55	0.53	0.51	0.51	0.48	0.57	0.40	0.46	0.46	0.39	0.49	0.06
10PB4/10	16	67.5	68.2	67.8	67.9	65.5	67.2	68.5	68.2	66.5	65.0		0.48	0.51	0.49	0.49	0.40	0.46	0.52	0.51	0.44	0.38	0.47	0.05
5P4/10	17	66.4	64.8	64.9	67.0	66.2	67.5	61.8	64.0	63.0	65.0		0.47	0.41	0.41	0.49	0.46	0.52	0.29	0.38	0.34	0.41	0.42	0.07
10P4/10	18	65.0	64.0	63.2	64.0	62.2	63.5	61.2	62.5	62.1	62.1		0.43	0.39	0.36	0.39	0.32	0.37	0.29	0.33	0.32	0.32	0.35	0.04
5RP4/10	19	64.1	62.9	64.8	60.5	61.8	63.9	61.1	60.5	62.5	61.0		0.41	0.37	0.44	0.28	0.33	0.41	0.30	0.28	0.35	0.30	0.35	0.06
10RP4/10	20	62.5	61.5	60.5	59.5	61.5	63.2	61.2	58.2	59.2	60.4		0.35	0.32	0.28	0.25	0.32	0.38	0.31	0.21	0.24	0.28	0.30	0.05
10RP3/8	21	65.2	65.5	67.5	66.7	66.5	67.6	66.9	66.2	62.4	64.5		0.24	0.25	0.33	0.31	0.30	0.34	0.30	0.27	0.12	0.20	0.27	0.07
5R5/6	22	54.8	53.6	54.5	54.6	55.9	57.6	58.3	56.8	57.1	54.5		0.36	0.33	0.36	0.36	0.40	0.45	0.45	0.41	0.42	0.34	0.39	0.04
10R3/4	23	70.6	70.8	69.8	67.1	68.8	68.2	66.5	67.5	68.1	69.0		0.47	0.48	0.43	0.32	0.39	0.37	0.28	0.32	0.34	0.38	0.38	0.07
5YR5/6	24	59.2	57.7	57.7	55.2	56.8	56.4	55.8	55.2	54.7	56.0		0.49	0.45	0.45	0.38	0.43	0.42	0.38	0.36	0.35	0.39	0.41	0.05
5Y5/6	25	63.2	60.6	61.3	69.2	68.2	68.1	58.7	57.6	57.7	57.6		0.63	0.53	0.56	0.88	0.83	0.83	0.46	0.42	0.43	0.42	0.60	0.18
5Y4/6	26	65.1	63.4	64.8	63.0	64.8	63.5	65.2	64.3	63.5	63.3		0.45	0.39	0.44	0.38	0.45	0.40	0.45	0.41	0.38	0.37	0.41	0.03
5GY5/6	27	62.7	62.4	62.2	59.3	58.5	60.3	61.5	61.7	59.2	59.6		0.59	0.57	0.57	0.47	0.45	0.51	0.53	0.54	0.45	0.47	0.51	0.05
5G5/6	28	57.5	59.7	58.6	57.0	58.2	58.0	57.6	58.1	59.4	56.8		0.38	0.44	0.41	0.37	0.40	0.40	0.37	0.38	0.42	0.34	0.39	0.03
5BG5/6	29	59.9	60.2	60.6	57.2	59.3	58.6	60.3	61.2	58.2	59.3		0.42	0.43	0.45	0.35	0.41	0.39	0.43	0.46	0.36	0.39	0.41	0.04
5B5/6	30	60.4	60.6	60.7	58.8	60.3	59.9	61.1	60.0	57.6	59.4		0.46	0.47	0.47	0.41	0.46	0.45	0.47	0.43	0.36	0.41	0.44	0.04
5PB5/6	31	65.6	65.5	65.4	62.2	62.3	62.3	62.8	63.3	63.1	63.2		0.66	0.66	0.65	0.54	0.54	0.54	0.54	0.56	0.55	0.56	0.58	0.05
5P5/6	32	60.2	61.3	61.4	61.5	60.3	61.2	58.7	58.5	58.0	59.3		0.49	0.53	0.53	0.54	0.50	0.53	0.43	0.43	0.41	0.45	0.48	0.05
5RP5/6	33	59.7	59.2	59.1	57.9	57.5	56.5	57.8	56.8	57.8	57.9		0.50	0.49	0.49	0.45	0.44	0.41	0.43	0.40	0.43	0.44	0.45	0.03
5R5/3	34	59.4	61.2	59.1	59.0	59.9	57.8	59.5	59.8	58.2	56.8		0.47	0.53	0.46	0.46	0.49	0.43	0.46	0.47	0.42	0.38	0.46	0.04
5Y5/3	35	60.4	60.1	61.7	59.8	59.2	59.9	60.1	58.7	59.3	58.5		0.52	0.51	0.56	0.50	0.49	0.51	0.50	0.45	0.47	0.45	0.50	0.03
5G5/3	36	62.4	62.7	62.7	60.6	61.2	61.2	61.6	62.3	60.3	61.3		0.55	0.57	0.57	0.50	0.52	0.52	0.51	0.54	0.47	0.50	0.52	0.03
5B5/3	37	63.8	64.4	65.7	62.8	67.1	62.7	61.6	63.2	64.0	63.3		0.60	0.63	0.68	0.57	0.74	0.57	0.51	0.57	0.60	0.57	0.60	0.07
5P5/3	38	59.6	58.9	59.5	59.6	58.0	59.5	59.7	59.6	60.2	60.3		0.46	0.44	0.46	0.47	0.42	0.46	0.45	0.45	0.47	0.47	0.45	0.02
N5	39	63.6	64.2	62.6	62.5	63.5	62.2	61.0	61.2	59.0	58.8		0.55	0.58	0.52	0.51	0.55	0.50	0.46	0.47	0.39	0.39	0.49	0.06

Table E-6a The brightness matching experimental data of subject RY at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	57.6	52.6	53.8	55.8	58.0	57.1	59.2	56.9	69.1	60.7		-0.37	-0.52	-0.49	-0.46	-0.40	-0.42	-0.35	-0.42	0.04	-0.30	-0.37	0.16
10R4/10	2	55.1	55.7	57.5	59.5	59.1	59.5	62.6	51.9	60.7	58.3		-0.45	-0.44	-0.39	-0.36	-0.37	-0.36	-0.24	-0.58	-0.30	-0.38	-0.39	0.09
5YR5/10	3	61.7	58.3	54.1	53.5	52.7	51.2	54.4	54.8	51.3	48.5		-0.06	-0.18	-0.30	-0.35	-0.38	-0.42	-0.32	-0.30	-0.40	-0.48	-0.32	0.12
10YR5/10	4	52.1	49.2	49.3	51.7	51.0	52.5	52.2	49.5	49.1	49.2		-0.18	-0.26	-0.26	-0.22	-0.24	-0.20	-0.20	-0.28	-0.28	-0.28	-0.24	0.04
5Y7/10	5	42.2	37.4	38.8	46.3	44.6	43.7	49.9	51.9	46.7	46.7		-0.32	-0.44	-0.41	-0.24	-0.29	-0.31	-0.14	-0.08	-0.22	-0.22	-0.27	0.11
10Y7/10	6	42.6	41.4	37.8	49.2	48.8	48.0	45.5	46.9	47.7	44.5		-0.30	-0.34	-0.43	-0.16	-0.17	-0.19	-0.25	-0.22	-0.19	-0.27	-0.25	0.08
5GY6/9	7	49.5	52.6	50.4	50.0	52.5	49.6	51.6	52.4	47.7	49.6		-0.28	-0.20	-0.26	-0.30	-0.23	-0.31	-0.25	-0.23	-0.35	-0.30	-0.27	0.05
10GY6/10	8	54.1	54.6	53.9	54.6	53.2	50.6	58.1	56.5	53.5	53.5		-0.18	-0.16	-0.18	-0.20	-0.24	-0.31	-0.09	-0.13	-0.22	-0.22	-0.19	0.06
5G5/10	9	54.5	54.2	53.3	56.6	57.6	56.5	55.7	58.1	55.2	55.6		-0.36	-0.37	-0.40	-0.34	-0.31	-0.34	-0.35	-0.28	-0.36	-0.35	-0.35	0.03
10G5/10	10	53.2	61.2	62.8	56.1	60.3	56.3	58.1	58.6	54.7	56.7		-0.44	-0.19	-0.13	-0.38	-0.26	-0.38	-0.32	-0.30	-0.41	-0.35	-0.32	0.10
5BG4/9	11	62.1	65.0	63.9	66.1	66.4	67.2	67.2	66.1	63.8	66.1		-0.37	-0.26	-0.31	-0.25	-0.24	-0.21	-0.20	-0.25	-0.33	-0.24	-0.27	0.05
10BG4/9	12	66.7	67.7	66.9	66.6	68.3	68.2	71.8	73.6	66.7	66.3		-0.21	-0.17	-0.20	-0.25	-0.18	-0.18	-0.01	0.09	-0.23	-0.25	-0.16	0.11
5B4/9	13	69.2	70.4	69.4	65.7	65.0	65.3	71.1	68.4	67.7	67.1		-0.11	-0.05	-0.10	-0.29	-0.32	-0.31	-0.04	-0.17	-0.19	-0.22	-0.18	0.10
10B4/10	14	63.3	60.3	60.1	65.6	66.8	68.1	63.8	62.5	61.6	64.5		-0.36	-0.46	-0.47	-0.30	-0.25	-0.20	-0.37	-0.41	-0.44	-0.33	-0.36	0.09
5PB4/10	15	64.5	63.8	62.4	63.2	64.4	64.8	63.0	64.0	65.6	65.1		-0.29	-0.31	-0.37	-0.37	-0.32	-0.31	-0.37	-0.33	-0.26	-0.28	-0.32	0.04
10PB4/10	16	63.6	64.7	63.5	62.3	65.6	64.3	65.1	65.5	60.8	62.5		-0.27	-0.23	-0.28	-0.36	-0.23	-0.28	-0.24	-0.23	-0.40	-0.34	-0.29	0.06
5P4/10	17	58.3	61.2	64.1	59.6	60.2	63.2	64.2	65.2	61.4	60.2		-0.42	-0.33	-0.22	-0.42	-0.40	-0.29	-0.25	-0.21	-0.34	-0.38	-0.33	0.08
10P4/10	18	59.6	58.9	58.7	62.1	60.3	60.9	69.7	61.5	56.7	57.2		-0.37	-0.39	-0.39	-0.31	-0.38	-0.36	0.00	-0.33	-0.47	-0.46	-0.34	0.13
5RP4/10	19	53.5	56.3	57.3	57.3	56.2	57.6	60.2	62.5	59.2	62.5		-0.52	-0.44	-0.41	-0.44	-0.48	-0.44	-0.35	-0.27	-0.37	-0.26	-0.40	0.09
10RP4/10	20	55.3	54.4	55.5	57.8	57.6	56.6	62.2	63.1	56.6	59.5		-0.46	-0.49	-0.46	-0.42	-0.43	-0.46	-0.27	-0.24	-0.44	-0.36	-0.40	0.09
10RP3/8	21	69.7	69.3	67.2	64.8	66.1	66.6	63.7	65.6	64.2	63.6		-0.21	-0.23	-0.32	-0.45	-0.40	-0.38	-0.49	-0.41	-0.46	-0.48	-0.38	0.10
5R5/6	22	54.6	55.3	54.5	57.6	58.3	56.6	56.4	56.5	55.1	54.5		-0.28	-0.26	-0.29	-0.23	-0.21	-0.26	-0.26	-0.26	-0.29	-0.31	-0.26	0.03
10R3/4	23	68.3	69.8	69.7	71.8	72.2	71.3	64.2	64.2	69.3	67.8		-0.28	-0.21	-0.21	-0.15	-0.13	-0.17	-0.47	-0.47	-0.25	-0.32	-0.26	0.12
5YR5/6	24	58.7	59.8	59.6	56.5	63.3	64.6	58.4	59.8	54.8	54.5		-0.16	-0.13	-0.14	-0.26	-0.04	0.01	-0.20	-0.16	-0.30	-0.31	-0.17	0.10
5Y5/6	25	55.8	53.9	53.6	57.4	56.5	56.2	58.7	58.2	58.8	58.7		-0.26	-0.31	-0.32	-0.25	-0.27	-0.28	-0.20	-0.21	-0.19	-0.19	-0.25	0.05
5Y4/6	26	64.6	66.0	65.9	68.2	70.2	69.5	60.6	61.0	62.6	61.1		-0.21	-0.15	-0.15	-0.09	0.00	-0.04	-0.38	-0.37	-0.30	-0.36	-0.20	0.14
5GY5/6	27	58.7	59.6	60.5	61.8	64.0	63.7	57.7	56.5	56.6	57.2		-0.19	-0.16	-0.13	-0.12	-0.04	-0.05	-0.25	-0.28	-0.27	-0.26	-0.18	0.09
5G5/6	28	60.2	55.7	56.3	58.7	59.2	58.8	54.6	53.6	56.5	58.5		-0.18	-0.32	-0.30	-0.26	-0.25	-0.26	-0.38	-0.41	-0.31	-0.25	-0.29	0.07
5BG5/6	29	57.4	58.6	56.7	58.2	61.4	61.7	57.3	56.9	58.5	57.2		-0.29	-0.26	-0.31	-0.30	-0.20	-0.19	-0.32	-0.34	-0.28	-0.32	-0.28	0.05
5B5/6	30	54.4	56.7	55.6	60.8	60.0	58.1	58.7	56.7	55.7	57.1		-0.36	-0.30	-0.33	-0.20	-0.23	-0.29	-0.27	-0.33	-0.35	-0.31	-0.30	0.05
5PB5/6	31	54.0	55.6	56.1	58.6	59.8	59.6	60.5	59.3	57.5	56.9		-0.37	-0.32	-0.31	-0.27	-0.23	-0.23	-0.20	-0.24	-0.29	-0.30	-0.27	0.05
5P5/6	32	57.2	54.9	55.1	60.3	60.7	60.6	55.8	55.6	56.1	57.1		-0.24	-0.31	-0.30	-0.18	-0.17	-0.17	-0.31	-0.32	-0.29	-0.27	-0.26	0.06
5RP5/6	33	51.7	49.8	50.6	59.6	58.4	59.7	58.1	57.5	51.6	53.9		-0.38	-0.43	-0.41	-0.18	-0.21	-0.17	-0.21	-0.23	-0.40	-0.33	-0.29	0.10
5R5/3	34	55.7	54.3	54.5	59.2	59.2	57.1	59.9	58.2	56.8	56.9		-0.28	-0.32	-0.31	-0.21	-0.21	-0.27	-0.18	-0.23	-0.27	-0.27	-0.26	0.05
5Y5/3	35	57.0	55.5	54.9	59.6	60.5	58.9	57.1	56.7	57.5	54.5		-0.23	-0.27	-0.29	-0.18	-0.15	-0.21	-0.25	-0.26	-0.23	-0.32	-0.24	0.05
5G5/3	36	61.1	60.4	58.9	63.1	62.3	60.5	57.6	55.5	58.2	56.5		-0.13	-0.16	-0.21	-0.10	-0.13	-0.19	-0.27	-0.33	-0.25	-0.30	-0.21	0.08
5B5/3	37	55.1	57.5	56.1	59.5	60.4	58.5	56.7	59.1	56.8	55.5		-0.32	-0.25	-0.29	-0.23	-0.20	-0.26	-0.30	-0.23	-0.29	-0.33	-0.27	0.04
5P5/3	38	57.5	60.1	61.4	59.5	60.6	60.7	58.7	60.4	58.0	56.5		-0.25	-0.17	-0.12	-0.22	-0.18	-0.18	-0.24	-0.18	-0.25	-0.30	-0.21	0.05
N5	39	55.8	54.2	54.0	56.6	57.1	55.8	58.3	59.6	58.1	59.5		-0.29	-0.34	-0.35	-0.31	-0.29	-0.33	-0.25	-0.21	-0.25	-0.20	-0.28	0.05

Table E-6b The brightness matching experimental data of subject RY at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	62.7	63.8	61.8	62.3	62.5	63.2	53.8	54.5	51.5	55.0		0.43	0.48	0.40	0.42	0.43	0.45	0.15	0.17	0.09	0.19	0.32	0.15
10R4/10	2	65.6	61.5	59.7	69.6	70.1	69.5	57.7	57.8	53.3	54.1		0.54	0.38	0.32	0.71	0.73	0.70	0.26	0.26	0.13	0.16	0.42	0.23
5YR5/10	3	57.6	55.2	55.4	58.5	55.5	58.5	56.7	53.4	51.5	50.7		0.44	0.37	0.38	0.47	0.38	0.47	0.41	0.32	0.27	0.25	0.38	0.08
10YR5/10	4	57.2	56.7	57.6	55.3	51.1	54.5	51.2	51.4	48.2	48.3		0.61	0.60	0.62	0.56	0.43	0.53	0.43	0.44	0.36	0.36	0.49	0.10
5Y7/10	5	53.1	54.2	56.7	49.8	52.1	54.2	44.7	49.2	48.0	47.1		0.62	0.65	0.72	0.53	0.59	0.65	0.39	0.51	0.48	0.46	0.56	0.11
10Y7/10	6	51.7	52.4	52.3	57.1	54.1	51.2	46.7	48.8	43.7	43.9		0.58	0.60	0.60	0.74	0.65	0.57	0.44	0.50	0.37	0.37	0.54	0.12
5GY6/9	7	56.6	57.2	55.7	55.5	55.5	57.9	51.1	49.7	49.8	50.7		0.56	0.58	0.53	0.53	0.53	0.60	0.40	0.36	0.37	0.39	0.49	0.09
10GY6/10	8	57.2	58.2	54.8	58.6	60.1	58.6	52.0	51.4	48.7	52.0		0.55	0.58	0.48	0.60	0.64	0.60	0.40	0.38	0.31	0.40	0.49	0.11
5G5/10	9	59.7	61.2	61.1	60.5	61.5	62.6	60.7	60.5	51.3	52.5		0.43	0.48	0.48	0.46	0.50	0.53	0.46	0.46	0.19	0.22	0.42	0.12
10G5/10	10	64.2	63.1	61.7	59.4	58.6	58.5	58.2	60.7	57.3	58.8		0.56	0.52	0.47	0.39	0.37	0.36	0.35	0.43	0.33	0.37	0.41	0.08
5BG4/9	11	69.7	73.3	67.9	66.5	64.8	67.1	64.5	64.6	60.7	62.6		0.57	0.75	0.49	0.44	0.37	0.46	0.35	0.36	0.22	0.29	0.43	0.15
10BG4/9	12	69.2	64.3	67.1	70.6	69.5	69.5	66.0	64.8	62.0	63.1		0.54	0.33	0.44	0.60	0.55	0.55	0.40	0.35	0.25	0.29	0.43	0.12
5B4/9	13	69.3	69.2	70.1	66.7	69.2	65.6	64.7	63.6	63.5	64.2		0.54	0.53	0.57	0.42	0.53	0.38	0.34	0.30	0.30	0.33	0.42	0.11
10B4/10	14	69.7	67.9	68.4	70.2	70.5	69.9	65.3	64.7	59.8	61.7		0.55	0.47	0.49	0.57	0.59	0.56	0.36	0.33	0.16	0.23	0.43	0.15
5PB4/10	15	68.9	70.1	66.8	67.5	68.4	68.8	65.3	65.6	64.7	64.3		0.54	0.59	0.44	0.47	0.51	0.53	0.38	0.39	0.37	0.35	0.46	0.08
10PB4/10	16	66.3	66.2	65.5	68.1	67.5	65.2	64.6	67.5	64.2	63.3		0.47	0.47	0.44	0.55	0.52	0.43	0.40	0.52	0.39	0.36	0.45	0.06
5P4/10	17	62.5	66.6	63.7	67.2	64.9	65.8	59.4	59.9	60.8	61.2		0.36	0.52	0.40	0.54	0.45	0.48	0.25	0.26	0.30	0.31	0.39	0.11
10P4/10	18	61.2	62.3	62.6	62.0	61.8	61.5	57.8	58.5	57.7	55.8		0.33	0.37	0.38	0.36	0.35	0.34	0.22	0.24	0.22	0.16	0.30	0.08
5RP4/10	19	60.9	60.9	60.3	61.6	58.6	58.7	49.8	51.5	49.5	54.2		0.34	0.34	0.32	0.37	0.27	0.27	0.01	0.06	0.01	0.14	0.21	0.14
10RP4/10	20	63.8	58.9	61.2	62.8	63.2	64.1	53.8	55.2	52.0	52.8		0.45	0.28	0.36	0.42	0.43	0.47	0.13	0.17	0.08	0.11	0.29	0.15
10RP3/8	21	63.2	66.7	64.8	65.1	64.5	65.2	64.5	64.0	60.0	61.3		0.16	0.30	0.22	0.24	0.21	0.24	0.23	0.21	0.05	0.10	0.20	0.07
5R5/6	22	61.2	61.4	57.9	56.4	58.0	57.4	58.5	57.7	54.5	56.7		0.56	0.57	0.45	0.41	0.46	0.44	0.49	0.46	0.36	0.42	0.46	0.06
10R3/4	23	69.2	71.6	71.6	73.1	73.1	73.5	69.0	69.4	66.2	65.4		0.40	0.52	0.52	0.60	0.60	0.62	0.41	0.43	0.28	0.25	0.46	0.13
5YR5/6	24	59.2	58.7	57.4	57.6	57.4	57.7	66.0	65.8	50.3	51.2		0.49	0.48	0.44	0.44	0.44	0.45	0.76	0.75	0.24	0.26	0.47	0.17
5Y5/6	25	66.4	65.1	61.7	62.3	63.5	60.0	65.2	64.5	59.5	57.4		0.75	0.69	0.57	0.59	0.63	0.51	0.72	0.69	0.50	0.43	0.61	0.11
5Y4/6	26	69.2	69.3	69.5	68.2	67.6	66.5	66.1	68.7	55.4	54.8		0.62	0.63	0.64	0.58	0.56	0.51	0.51	0.62	0.13	0.11	0.49	0.20
5GY5/6	27	64.5	64.8	63.1	64.2	62.2	60.6	62.0	56.6	52.3	50.8		0.65	0.66	0.60	0.64	0.57	0.51	0.58	0.40	0.26	0.22	0.51	0.16
5G5/6	28	63.6	59.4	60.7	59.6	60.5	59.2	63.5	61.2	57.2	55.6		0.58	0.43	0.48	0.44	0.47	0.43	0.59	0.51	0.37	0.32	0.46	0.08
5BG5/6	29	63.6	61.5	63.9	60.5	62.5	62.6	61.0	60.5	60.2	57.8		0.55	0.48	0.57	0.44	0.51	0.52	0.48	0.46	0.44	0.36	0.48	0.06
5B5/6	30	64.7	66.2	64.7	63.8	62.9	62.7	62.3	61.0	55.0	54.7		0.61	0.67	0.61	0.58	0.55	0.54	0.54	0.49	0.30	0.29	0.52	0.13
5PB5/6	31	62.6	62.4	62.7	69.0	66.3	66.5	62.1	62.0	57.1	55.4		0.54	0.54	0.55	0.80	0.69	0.70	0.54	0.54	0.37	0.32	0.56	0.15
5P5/6	32	61.2	59.3	58.6	59.6	59.8	58.0	60.8	61.6	56.2	56.3		0.52	0.46	0.44	0.47	0.48	0.42	0.53	0.56	0.37	0.37	0.46	0.06
5RP5/6	33	60.3	62.9	61.6	58.7	62.1	59.7	58.3	58.0	48.9	49.7		0.52	0.61	0.57	0.47	0.59	0.50	0.47	0.47	0.19	0.21	0.46	0.15
5R5/3	34	63.5	63.9	64.3	57.6	59.5	57.3	63.7	62.5	53.2	54.4		0.61	0.63	0.64	0.41	0.47	0.41	0.64	0.59	0.29	0.33	0.50	0.14
5Y5/3	35	59.3	61.4	61.1	63.5	60.7	63.2	67.1	66.0	54.9	56.2		0.48	0.55	0.54	0.63	0.53	0.62	0.79	0.74	0.36	0.39	0.56	0.14
5G5/3	36	65.6	63.8	65.7	61.6	61.3	61.5	65.0	65.2	57.9	57.2		0.67	0.60	0.68	0.52	0.51	0.52	0.67	0.67	0.41	0.39	0.56	0.11
5B5/3	37	64.4	64.2	62.2	61.8	61.3	61.3	64.6	64.5	55.5	54.6		0.62	0.62	0.54	0.53	0.51	0.51	0.65	0.64	0.33	0.31	0.53	0.12
5P5/3	38	63.9	59.7	61.6	61.3	62.2	63.5	62.5	61.4	54.3	51.8		0.61	0.46	0.53	0.52	0.55	0.60	0.57	0.54	0.30	0.23	0.49	0.13
N5	39	62.4	62.7	62.4	62.4	62.9	60.6	62.6	64.1	55.7	56.6		0.55	0.57	0.55	0.56	0.57	0.49	0.56	0.62	0.35	0.37	0.52	0.09

Table E-7a The brightness matching experimental data of subject YT at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	53.9	57.0	57.2	55.0	55.2	53.5	53.4	53.0	53.1	51.4		-0.59	-0.50	-0.50	-0.51	-0.50	-0.56	-0.56	-0.57	-0.58	-0.63	-0.55	0.05
10R4/10	2	56.0	54.6	57.1	55.2	54.7	54.3	55.1	56.8	51.5	55.1		-0.54	-0.58	-0.51	-0.51	-0.53	-0.54	-0.52	-0.47	-0.64	-0.53	-0.54	0.05
5YR5/10	3	50.8	55.0	55.8	49.5	47.5	47.3	46.6	47.8	51.2	50.3		-0.50	-0.38	-0.36	-0.49	-0.55	-0.55	-0.57	-0.54	-0.46	-0.48	-0.49	0.07
10YR5/10	4	46.1	48.7	48.4	46.3	45.0	44.6	43.5	46.5	48.4	47.6		-0.45	-0.38	-0.39	-0.40	-0.43	-0.44	-0.48	-0.40	-0.36	-0.38	-0.41	0.04
5Y7/10	5	43.5	44.3	42.8	44.7	43.7	44.0	46.4	44.4	42.9	44.2		-0.39	-0.37	-0.41	-0.31	-0.34	-0.33	-0.27	-0.32	-0.38	-0.34	-0.35	0.04
10Y7/10	6	42.7	44.8	43.2	43.7	42.2	44.6	42.7	42.8	44.5	44.3		-0.41	-0.36	-0.40	-0.33	-0.37	-0.31	-0.36	-0.36	-0.33	-0.33	-0.36	0.03
5GY6/9	7	47.3	48.8	49.5	44.3	45.5	46.5	46.6	48.2	49.0	50.4		-0.45	-0.41	-0.39	-0.48	-0.45	-0.43	-0.43	-0.38	-0.37	-0.33	-0.41	0.04
10GY6/10	8	51.3	51.6	52.3	49.3	47.5	48.5	46.2	46.5	47.3	49.2		-0.37	-0.36	-0.34	-0.37	-0.42	-0.40	-0.46	-0.46	-0.45	-0.39	-0.40	0.04
5G5/10	9	53.9	51.5	54.4	48.9	52.2	47.7	50.3	53.6	52.0	55.0		-0.49	-0.56	-0.47	-0.58	-0.49	-0.62	-0.55	-0.45	-0.51	-0.42	-0.51	0.06
10G5/10	10	54.6	52.9	53.0	50.0	55.0	54.5	43.0	54.2	55.5	53.4		-0.50	-0.55	-0.55	-0.59	-0.44	-0.46	-0.78	-0.47	-0.44	-0.50	-0.53	0.10
5BG4/9	11	57.3	56.1	60.0	59.6	61.0	60.0	60.5	62.1	61.2	60.0		-0.64	-0.67	-0.56	-0.52	-0.47	-0.51	-0.49	-0.44	-0.48	-0.52	-0.53	0.07
10BG4/9	12	60.4	59.3	56.2	58.0	58.3	58.0	57.9	59.7	57.0	57.7		-0.56	-0.60	-0.69	-0.59	-0.58	-0.59	-0.59	-0.54	-0.63	-0.61	-0.60	0.04
5B4/9	13	61.2	62.4	61.4	59.7	60.3	57.0	62.5	61.6	58.9	59.3		-0.54	-0.49	-0.53	-0.54	-0.52	-0.62	-0.44	-0.48	-0.58	-0.57	-0.53	0.05
10B4/10	14	60.3	61.0	64.2	59.3	57.6	59.0	61.5	62.9	60.9	60.0		-0.57	-0.55	-0.43	-0.56	-0.61	-0.57	-0.49	-0.44	-0.52	-0.55	-0.53	0.06
5PB4/10	15	60.7	60.2	63.0	61.5	61.0	59.0	62.8	64.5	60.3	62.9		-0.54	-0.55	-0.45	-0.46	-0.47	-0.54	-0.41	-0.35	-0.52	-0.42	-0.47	0.07
10PB4/10	16	61.0	61.9	61.1	57.3	58.0	57.6	58.2	60.0	58.3	60.5		-0.48	-0.45	-0.48	-0.55	-0.53	-0.54	-0.52	-0.47	-0.53	-0.46	-0.50	0.04
5P4/10	17	53.2	55.4	55.0	53.5	55.5	57.5	58.3	56.9	63.5	59.8		-0.69	-0.62	-0.63	-0.63	-0.57	-0.51	-0.49	-0.53	-0.32	-0.45	-0.54	0.11
10P4/10	18	57.0	56.3	57.2	56.5	54.5	57.0	58.4	58.9	57.9	56.0		-0.55	-0.57	-0.55	-0.52	-0.58	-0.50	-0.47	-0.45	-0.49	-0.55	-0.52	0.04
5RP4/10	19	55.3	56.1	57.8	54.5	50.7	51.0	57.5	56.9	55.5	55.6		-0.58	-0.55	-0.50	-0.55	-0.66	-0.65	-0.47	-0.48	-0.54	-0.53	-0.55	0.06
10RP4/10	20	55.3	56.2	58.6	54.3	54.0	55.0	56.6	58.5	56.0	54.0		-0.57	-0.55	-0.48	-0.55	-0.56	-0.53	-0.49	-0.43	-0.52	-0.58	-0.53	0.05
10RP3/8	21	62.1	62.5	64.4	60.5	61.0	63.2	62.3	62.1	62.4	60.7		-0.60	-0.59	-0.52	-0.66	-0.64	-0.56	-0.57	-0.58	-0.58	-0.64	-0.59	0.04
5R5/6	22	47.3	47.9	48.1	49.0	47.0	48.3	50.1	49.8	48.3	50.6		-0.57	-0.56	-0.55	-0.53	-0.58	-0.55	-0.48	-0.49	-0.54	-0.48	-0.53	0.04
10R3/4	23	60.2	60.7	59.6	64.5	66.0	61.3	65.5	67.3	61.5	65.2		-0.67	-0.65	-0.69	-0.52	-0.46	-0.63	-0.46	-0.38	-0.62	-0.48	-0.56	0.11
5YR5/6	24	52.6	50.7	51.4	52.0	52.1	47.5	51.4	51.9	53.9	50.5		-0.43	-0.48	-0.46	-0.45	-0.44	-0.57	-0.44	-0.43	-0.38	-0.48	-0.46	0.05
5Y5/6	25	55.0	53.7	53.2	50.5	53.0	51.0	58.1	55.3	53.7	55.9		-0.36	-0.40	-0.42	-0.49	-0.42	-0.48	-0.25	-0.34	-0.40	-0.33	-0.39	0.07
5Y4/6	26	57.9	56.8	61.4	56.3	55.0	52.0	55.0	58.5	61.6	60.8		-0.52	-0.56	-0.41	-0.57	-0.61	-0.70	-0.59	-0.48	-0.39	-0.42	-0.52	0.10
5GY5/6	27	48.0	50.2	49.0	53.3	55.3	54.0	54.9	55.0	55.9	51.6		-0.58	-0.52	-0.56	-0.44	-0.37	-0.41	-0.37	-0.36	-0.35	-0.48	-0.44	0.09
5G5/6	28	52.9	56.8	55.7	53.7	50.3	56.0	52.9	51.2	50.6	51.8		-0.48	-0.37	-0.40	-0.46	-0.56	-0.39	-0.46	-0.51	-0.54	-0.51	-0.47	0.06
5BG5/6	29	53.4	52.7	52.9	55.5	52.5	55.6	53.3	55.2	52.1	53.5		-0.50	-0.52	-0.51	-0.43	-0.52	-0.43	-0.48	-0.42	-0.53	-0.48	-0.48	0.04
5B5/6	30	53.0	49.6	51.0	51.5	52.5	54.7	53.5	55.2	57.0	55.5		-0.49	-0.59	-0.55	-0.53	-0.51	-0.44	-0.46	-0.40	-0.37	-0.41	-0.47	0.07
5PB5/6	31	52.7	52.8	54.1	58.5	56.3	58.5	57.0	56.8	52.3	53.6		-0.49	-0.49	-0.45	-0.32	-0.38	-0.32	-0.34	-0.35	-0.49	-0.46	-0.41	0.07
5P5/6	32	53.2	53.6	54.9	55.3	52.8	54.5	55.3	54.8	53.3	53.1		-0.44	-0.43	-0.39	-0.38	-0.46	-0.40	-0.36	-0.38	-0.43	-0.44	-0.41	0.03
5RP5/6	33	49.3	52.2	48.7	51.6	51.5	52.3	54.5	52.8	50.5	48.9		-0.53	-0.45	-0.54	-0.46	-0.46	-0.44	-0.36	-0.41	-0.48	-0.53	-0.47	0.06
5R5/3	34	49.5	48.3	50.3	55.6	50.5	51.7	50.6	47.6	51.3	49.3		-0.54	-0.58	-0.52	-0.37	-0.52	-0.48	-0.49	-0.58	-0.49	-0.54	-0.51	0.06
5Y5/3	35	53.9	51.4	50.6	52.0	54.5	56.0	52.3	54.5	54.7	56.5		-0.40	-0.48	-0.50	-0.46	-0.38	-0.34	-0.43	-0.36	-0.37	-0.32	-0.40	0.06
5G5/3	36	50.2	54.1	50.6	54.3	54.5	53.5	55.1	56.3	56.1	54.6		-0.54	-0.43	-0.53	-0.43	-0.42	-0.45	-0.38	-0.35	-0.37	-0.41	-0.43	0.06
5B5/3	37	52.5	49.8	51.3	54.0	53.2	56.5	56.5	55.4	53.5	53.5		-0.48	-0.56	-0.52	-0.44	-0.46	-0.37	-0.35	-0.38	-0.45	-0.45	-0.44	0.07
5P5/3	38	53.0	50.7	54.0	55.0	54.3	56.5	57.3	55.8	52.1	54.0		-0.46	-0.53	-0.43	-0.40	-0.42	-0.36	-0.32	-0.36	-0.48	-0.42	-0.42	0.06
N5	39	55.5	56.8	57.6	53.6	52.5	55.0	56.6	58.2	53.2	58.4		-0.41	-0.38	-0.35	-0.42	-0.45	-0.38	-0.34	-0.29	-0.45	-0.29	-0.38	0.06

Table E-7b The brightness matching experimental data of subject YT at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	68.0	68.0	68.7	66.5	67.0	67.0	64.5	65.5	60.0	61.0		0.57	0.57	0.60	0.49	0.51	0.51	0.43	0.47	0.24	0.27	0.46	0.12
10R4/10	2	67.0	68.0	69.0	68.5	69.0	69.5	64.5	67.0	62.0	64.0		0.51	0.56	0.60	0.56	0.59	0.61	0.42	0.52	0.30	0.37	0.50	0.11
5YR5/10	3	60.5	61.0	64.0	58.0	61.0	62.5	65.5	64.5	60.5	61.5		0.45	0.47	0.58	0.36	0.46	0.51	0.64	0.60	0.43	0.47	0.50	0.09
10YR5/10	4	61.0	62.0	58.5	57.5	57.5	57.5	58.5	59.5	62.0	57.0		0.65	0.69	0.57	0.52	0.52	0.52	0.57	0.60	0.66	0.50	0.58	0.07
5Y7/10	5	56.0	55.0	58.0	56.0	53.5	56.0	53.5	54.5	56.5	58.5		0.62	0.60	0.68	0.61	0.54	0.61	0.55	0.58	0.62	0.68	0.61	0.05
10Y7/10	6	57.0	57.0	56.0	57.5	56.5	57.5	53.5	57.0	57.0	58.0		0.66	0.66	0.63	0.66	0.63	0.66	0.56	0.66	0.64	0.67	0.64	0.03
5GY6/9	7	61.0	62.5	61.0	61.0	60.5	61.5	57.5	57.5	63.0	64.5		0.62	0.67	0.62	0.60	0.59	0.62	0.51	0.51	0.67	0.73	0.61	0.07
10GY6/10	8	57.0	61.5	59.5	58.5	58.0	61.0	60.0	60.5	58.0	58.0		0.47	0.61	0.54	0.50	0.48	0.58	0.56	0.58	0.47	0.47	0.53	0.05
5G5/10	9	62.5	65.5	64.5	63.0	65.0	67.0	61.5	63.5	61.5	63.0		0.45	0.56	0.52	0.45	0.53	0.61	0.42	0.49	0.39	0.45	0.49	0.07
10G5/10	10	64.0	63.5	65.5	64.5	63.5	66.0	62.0	63.0	65.5	65.0		0.47	0.45	0.53	0.48	0.44	0.54	0.40	0.44	0.51	0.49	0.47	0.04
5BG4/9	11	69.5	69.0	69.5	69.0	68.5	69.5	69.5	71.0	70.0	70.5		0.49	0.46	0.49	0.45	0.43	0.47	0.49	0.56	0.49	0.51	0.48	0.04
10BG4/9	12	69.0	69.5	68.5	68.5	68.5	68.0	68.5	69.0	69.5	70.5		0.45	0.47	0.42	0.41	0.41	0.39	0.43	0.45	0.45	0.49	0.44	0.03
5B4/9	13	72.0	72.5	71.0	69.0	69.5	71.5	70.0	69.0	69.0	69.0		0.59	0.61	0.54	0.43	0.45	0.55	0.49	0.45	0.42	0.42	0.49	0.07
10B4/10	14	71.5	71.0	71.0	68.5	66.5	67.0	65.5	67.0	70.0	68.5		0.55	0.53	0.53	0.40	0.31	0.33	0.29	0.35	0.46	0.39	0.41	0.10
5PB4/10	15	68.0	69.0	68.0	65.0	68.5	68.5	70.5	69.0	68.5	68.5		0.42	0.46	0.42	0.28	0.42	0.42	0.53	0.46	0.42	0.42	0.42	0.06
10PB4/10	16	71.5	67.5	70.0	67.5	64.5	65.0	68.0	65.0	72.0	70.5		0.62	0.44	0.55	0.42	0.30	0.32	0.46	0.34	0.63	0.55	0.46	0.12
5P4/10	17	65.5	68.5	64.0	66.0	62.5	64.0	63.5	63.0	66.5	68.5		0.39	0.52	0.33	0.40	0.26	0.32	0.32	0.30	0.41	0.49	0.37	0.08
10P4/10	18	69.5	66.0	68.5	64.0	63.5	64.0	64.0	63.5	64.0	63.5		0.58	0.43	0.53	0.34	0.32	0.34	0.35	0.34	0.33	0.31	0.39	0.10
5RP4/10	19	65.0	66.0	65.0	65.5	66.5	64.5	68.0	64.0	63.5	65.5		0.42	0.46	0.42	0.42	0.46	0.38	0.54	0.38	0.34	0.41	0.42	0.06
10RP4/10	20	66.0	67.0	68.0	65.0	63.5	62.5	65.5	66.0	66.0	66.5		0.46	0.50	0.54	0.41	0.35	0.31	0.44	0.46	0.44	0.46	0.44	0.07
10RP3/8	21	70.0	69.5	71.5	66.5	66.5	68.0	68.5	69.0	71.0	70.5		0.34	0.31	0.41	0.24	0.24	0.30	0.30	0.32	0.39	0.37	0.32	0.06
5R5/6	22	61.0	61.0	58.5	62.5	60.0	60.0	61.0	60.5	60.5	59.5		0.44	0.44	0.36	0.55	0.47	0.47	0.47	0.46	0.43	0.40	0.45	0.05
10R3/4	23	71.5	70.0	72.5	68.5	66.5	70.5	70.5	71.5	72.0	72.0		0.41	0.33	0.46	0.32	0.24	0.41	0.39	0.44	0.44	0.44	0.39	0.07
5YR5/6	24	63.0	63.5	63.0	60.0	60.0	58.0	58.5	57.5	55.0	57.5		0.52	0.53	0.52	0.47	0.47	0.40	0.39	0.36	0.27	0.34	0.43	0.09
5Y5/6	25	62.5	60.5	64.0	64.0	66.0	65.0	63.5	65.0	65.0	67.5		0.49	0.42	0.54	0.60	0.68	0.64	0.56	0.61	0.59	0.69	0.58	0.08
5Y4/6	26	70.5	69.5	70.0	67.0	64.0	67.0	68.5	67.0	71.5	71.5		0.58	0.53	0.55	0.48	0.36	0.48	0.52	0.45	0.63	0.63	0.52	0.08
5GY5/6	27	65.0	67.0	67.5	66.0	63.5	65.5	62.0	63.5	67.5	66.0		0.56	0.64	0.66	0.66	0.56	0.64	0.48	0.54	0.67	0.61	0.60	0.06
5G5/6	28	67.5	65.5	65.5	62.5	61.5	63.0	65.0	65.0	66.5	66.5		0.63	0.55	0.55	0.49	0.45	0.51	0.56	0.56	0.59	0.59	0.55	0.05
5BG5/6	29	66.0	63.5	61.5	60.0	62.5	64.0	64.0	61.5	67.0	66.0		0.54	0.44	0.37	0.38	0.46	0.52	0.49	0.40	0.59	0.55	0.47	0.08
5B5/6	30	64.0	65.0	65.0	65.5	65.5	64.5	65.0	65.0	63.5	61.0		0.48	0.52	0.52	0.60	0.60	0.56	0.55	0.55	0.47	0.37	0.52	0.07
5PB5/6	31	67.0	67.0	68.0	65.5	64.0	64.5	65.5	66.5	66.5	67.5		0.61	0.61	0.65	0.60	0.55	0.57	0.58	0.62	0.59	0.63	0.60	0.03
5P5/6	32	63.0	61.5	62.0	63.0	61.5	63.5	61.0	58.5	61.5	62.0		0.48	0.43	0.44	0.54	0.49	0.56	0.44	0.36	0.43	0.45	0.46	0.06
5RP5/6	33	59.5	60.0	61.0	62.5	58.5	62.0	63.0	62.5	65.5	60.0		0.39	0.40	0.44	0.55	0.41	0.53	0.54	0.52	0.61	0.41	0.48	0.08
5R5/3	34	61.0	58.0	58.0	63.5	62.5	64.0	61.5	64.0	64.5	62.0		0.42	0.32	0.32	0.56	0.53	0.58	0.46	0.56	0.55	0.46	0.48	0.10
5Y5/3	35	65.5	66.0	64.0	59.5	63.5	60.5	66.5	62.5	65.5	67.0		0.60	0.62	0.54	0.44	0.58	0.47	0.67	0.51	0.60	0.66	0.57	0.08
5G5/3	36	67.0	63.5	65.0	65.0	64.5	65.5	60.5	58.0	64.5	65.5		0.62	0.48	0.54	0.60	0.58	0.62	0.41	0.33	0.53	0.57	0.53	0.10
5B5/3	37	67.5	67.0	66.5	69.0	68.0	67.0	59.0	61.0	64.5	63.0		0.64	0.62	0.60	0.77	0.72	0.68	0.36	0.42	0.53	0.47	0.58	0.13
5P5/3	38	57.5	61.0	60.0	62.0	61.5	61.5	65.0	68.0	67.5	66.0		0.28	0.40	0.36	0.49	0.47	0.47	0.58	0.70	0.65	0.59	0.50	0.13
N5	39	67.5	66.0	68.0	64.0	64.5	65.0	66.0	68.0	67.5	68.5		0.67	0.61	0.70	0.52	0.54	0.56	0.62	0.70	0.65	0.70	0.63	0.07

Table E-8a The brightness matching experimental data of subject WR at condition 5lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	62.0	59.8	57.2	61.5	61.3	61.7	59.6	59.2	60.0	61.0		-0.31	-0.39	-0.47	-0.34	-0.34	-0.33	-0.42	-0.43	-0.40	-0.37	-0.38	0.05
10R4/10	2	62.1	61.3	65.4	64.3	64.2	62.3	63.3	61.2	64.8	61.4		-0.32	-0.35	-0.19	-0.24	-0.24	-0.32	-0.29	-0.37	-0.24	-0.36	-0.29	0.06
5YR5/10	3	59.4	61.4	58.5	61.5	59.3	60.0	58.9	56.2	56.3	57.7		-0.23	-0.16	-0.25	-0.16	-0.23	-0.21	-0.26	-0.34	-0.34	-0.30	-0.25	0.07
10YR5/10	4	55.5	57.2	55.4	58.5	55.4	54.2	59.2	55.2	57.7	53.5		-0.16	-0.11	-0.16	-0.08	-0.17	-0.20	-0.07	-0.19	-0.12	-0.24	-0.15	0.06
5Y7/10	5	58.0	57.6	58.5	57.6	58.4	56.9	49.7	49.8	50.0	50.7		0.04	0.03	0.06	0.02	0.05	0.00	-0.22	-0.22	-0.21	-0.19	-0.06	0.13
10Y7/10	6	47.5	47.6	46.2	45.3	46.4	45.5	52.0	48.3	50.3	48.6		-0.26	-0.25	-0.29	-0.32	-0.29	-0.31	-0.15	-0.25	-0.20	-0.25	-0.26	0.05
5GY6/9	7	50.3	52.5	49.5	49.5	50.0	51.5	51.6	55.7	50.6	52.8		-0.34	-0.28	-0.37	-0.37	-0.36	-0.32	-0.33	-0.21	-0.36	-0.30	-0.32	0.05
10GY6/10	8	51.5	51.4	52.6	51.9	51.7	52.2	53.3	52.8	54.1	53.5		-0.34	-0.34	-0.31	-0.33	-0.34	-0.32	-0.31	-0.32	-0.28	-0.30	-0.32	0.02
5G5/10	9	55.2	57.2	56.2	56.5	56.4	57.5	58.7	57.5	59.8	57.0		-0.42	-0.37	-0.40	-0.39	-0.39	-0.36	-0.34	-0.38	-0.31	-0.39	-0.38	0.03
10G5/10	10	57.2	58.4	56.4	57.0	56.9	56.0	59.9	57.3	58.3	56.9		-0.40	-0.36	-0.42	-0.41	-0.41	-0.44	-0.34	-0.42	-0.39	-0.43	-0.40	0.03
5BG4/9	11	68.5	68.4	64.5	64.5	62.0	63.5	64.8	66.4	64.8	64.0		-0.20	-0.21	-0.37	-0.37	-0.46	-0.41	-0.38	-0.31	-0.38	-0.41	-0.35	0.09
10BG4/9	12	64.4	63.5	62.5	62.0	60.0	62.5	62.3	62.8	62.5	63.7		-0.39	-0.42	-0.46	-0.48	-0.55	-0.46	-0.49	-0.47	-0.48	-0.43	-0.46	0.04
5B4/9	13	63.4	64.4	63.0	62.5	62.9	64.2	63.8	61.2	62.2	61.8		-0.43	-0.39	-0.44	-0.47	-0.45	-0.40	-0.43	-0.53	-0.49	-0.51	-0.46	0.04
10B4/10	14	63.4	63.9	64.0	64.6	62.5	63.9	65.8	64.3	67.5	64.7		-0.44	-0.42	-0.41	-0.40	-0.48	-0.42	-0.36	-0.42	-0.29	-0.41	-0.41	0.05
5PB4/10	15	65.5	64.0	63.2	63.9	65.4	65.0	66.0	66.4	65.4	66.1		-0.33	-0.39	-0.42	-0.40	-0.34	-0.35	-0.33	-0.31	-0.36	-0.33	-0.36	0.03
10PB4/10	16	67.0	64.9	64.6	65.2	64.3	65.2	65.4	64.3	64.4	64.9		-0.22	-0.31	-0.32	-0.30	-0.34	-0.30	-0.31	-0.35	-0.35	-0.33	-0.31	0.04
5P4/10	17	61.2	62.1	60.9	63.5	61.4	61.2	64.5	62.5	62.5	62.8		-0.41	-0.38	-0.42	-0.33	-0.41	-0.42	-0.31	-0.39	-0.39	-0.38	-0.38	0.04
10P4/10	18	60.5	61.5	61.0	60.0	60.4	60.4	60.7	62.5	60.4	61.3		-0.42	-0.38	-0.40	-0.44	-0.43	-0.43	-0.43	-0.37	-0.44	-0.41	-0.42	0.02
5RP4/10	19	56.5	59.0	59.4	57.4	57.1	57.6	60.8	59.5	60.4	60.4		-0.52	-0.44	-0.43	-0.49	-0.50	-0.49	-0.40	-0.45	-0.42	-0.42	-0.46	0.04
10RP4/10	20	58.0	56.5	54.5	57.0	56.0	55.1	61.2	60.8	61.5	59.7		-0.47	-0.51	-0.57	-0.50	-0.53	-0.55	-0.38	-0.40	-0.37	-0.44	-0.47	0.07
10RP3/8	21	67.9	65.6	67.6	64.9	66.6	65.4	66.3	66.0	67.3	65.3		-0.41	-0.50	-0.42	-0.53	-0.46	-0.51	-0.46	-0.47	-0.42	-0.50	-0.47	0.04
5R5/6	22	55.5	53.4	56.2	53.9	53.5	52.9	57.2	56.1	55.2	55.2		-0.38	-0.44	-0.36	-0.43	-0.44	-0.46	-0.31	-0.34	-0.37	-0.37	-0.39	0.05
10R3/4	23	65.6	67.2	66.1	67.5	65.0	66.6	69.5	67.6	68.4	68.4		-0.51	-0.44	-0.49	-0.43	-0.53	-0.47	-0.33	-0.41	-0.38	-0.38	-0.44	0.07
5YR5/6	24	57.1	54.2	56.2	55.0	58.0	55.6	58.5	57.8	57.6	57.3		-0.33	-0.42	-0.36	-0.39	-0.31	-0.38	-0.27	-0.30	-0.30	-0.31	-0.34	0.05
5Y5/6	25	57.8	56.4	58.4	57.0	60.5	57.9	55.8	57.8	57.0	57.8		-0.32	-0.36	-0.30	-0.34	-0.23	-0.32	-0.36	-0.30	-0.33	-0.30	-0.32	0.04
5Y4/6	26	65.4	63.5	61.9	63.0	62.7	63.5	62.9	64.3	64.1	63.4		-0.29	-0.37	-0.43	-0.39	-0.40	-0.37	-0.38	-0.32	-0.33	-0.36	-0.36	0.04
5GY5/6	27	58.4	56.9	56.4	58.3	57.6	58.5	58.4	58.2	58.3	59.5		-0.32	-0.37	-0.38	-0.33	-0.35	-0.32	-0.31	-0.31	-0.31	-0.27	-0.33	0.03
5G5/6	28	58.0	56.9	58.2	58.1	57.8	57.5	55.6	56.6	56.2	56.6		-0.37	-0.40	-0.36	-0.37	-0.38	-0.39	-0.42	-0.40	-0.41	-0.40	-0.39	0.02
5BG5/6	29	59.5	57.5	59.6	58.1	59.6	59.0	56.1	56.9	55.9	56.2		-0.35	-0.41	-0.35	-0.39	-0.35	-0.37	-0.44	-0.41	-0.44	-0.43	-0.39	0.04
5B5/6	30	58.5	57.0	56.0	57.1	57.4	56.1	59.1	59.3	59.3	59.8		-0.36	-0.41	-0.44	-0.41	-0.40	-0.44	-0.33	-0.32	-0.32	-0.31	-0.37	0.05
5PB5/6	31	56.7	55.8	55.6	57.1	56.0	57.5	60.2	59.7	59.7	59.4		-0.41	-0.43	-0.44	-0.40	-0.43	-0.39	-0.29	-0.30	-0.30	-0.31	-0.37	0.06
5P5/6	32	55.0	54.0	53.9	54.0	52.5	54.6	54.4	54.7	55.0	56.5		-0.43	-0.46	-0.46	-0.46	-0.50	-0.44	-0.43	-0.42	-0.41	-0.37	-0.44	0.04
5RP5/6	33	55.5	55.2	55.5	54.0	54.6	54.0	56.7	56.0	56.8	56.0		-0.38	-0.39	-0.38	-0.43	-0.41	-0.43	-0.33	-0.35	-0.33	-0.35	-0.38	0.04
5R5/3	34	53.1	52.6	54.0	55.4	53.3	53.5	55.7	54.7	52.5	55.6		-0.48	-0.49	-0.45	-0.41	-0.47	-0.47	-0.38	-0.41	-0.48	-0.39	-0.44	0.04
5Y5/3	35	55.5	56.1	56.5	57.5	57.2	57.6	58.8	58.5	58.0	58.5		-0.39	-0.37	-0.36	-0.34	-0.34	-0.33	-0.28	-0.29	-0.30	-0.29	-0.33	0.04
5G5/3	36	59.2	59.0	56.2	57.2	58.3	57.9	56.3	56.0	56.9	56.2		-0.32	-0.32	-0.41	-0.38	-0.35	-0.36	-0.39	-0.40	-0.37	-0.39	-0.37	0.03
5B5/3	37	57.4	57.0	57.5	57.0	56.5	57.5	58.2	58.2	56.8	57.4		-0.38	-0.39	-0.37	-0.39	-0.40	-0.37	-0.34	-0.34	-0.38	-0.36	-0.37	0.02
5P5/3	38	56.2	55.5	58.0	57.1	51.5	56.5	56.1	56.7	56.8	55.7		-0.40	-0.42	-0.35	-0.38	-0.54	-0.40	-0.39	-0.37	-0.37	-0.40	-0.40	0.05
N5	39	57.9	57.9	56.5	57.6	58.0	56.6	59.0	60.0	57.5	56.5		-0.32	-0.32	-0.36	-0.33	-0.32	-0.36	-0.30	-0.27	-0.35	-0.38	-0.33	0.03

Table E-8b The brightness matching experimental data of subject WR at condition 50lux.

ColorChart	No.	raw1	raw 2	raw 3	raw 4	raw 5	raw 6	raw7	raw 8	raw9	raw10		cal 1	cal 2	cal 3	cal 4	cal 5	cal 6	cal 7	cal 8	cal 9	cal 10	mean	STDEV
5R4/10	1	65.3	67.1	66.3	66.2	66.7	67.3	71.2	69.8	69.0	67.7		0.47	0.55	0.51	0.50	0.52	0.55	0.72	0.65	0.61	0.56	0.56	0.08
10R4/10	2	65.4	63.5	64.6	68.2	69.5	68.8	71.2	71.4	68.0	67.3		0.47	0.39	0.44	0.58	0.64	0.60	0.71	0.72	0.56	0.53	0.56	0.11
5YR5/10	3	64.8	64.9	63.3	67.9	68.0	66.2	69.8	68.3	67.5	68.7		0.63	0.63	0.57	0.75	0.75	0.68	0.83	0.76	0.73	0.78	0.71	0.08
10YR5/10	4	60.3	62.5	60.1	66.5	66.2	65.8	66.2	65.3	64.7	60.5		0.64	0.72	0.64	0.87	0.86	0.84	0.86	0.82	0.79	0.64	0.77	0.10
5Y7/10	5	59.7	58.9	57.6	60.8	58.9	59.4	61.3	61.2	60.5	57.5		0.75	0.73	0.69	0.78	0.72	0.74	0.80	0.80	0.77	0.67	0.75	0.04
10Y7/10	6	57.6	59.2	58.9	68.9	57.7	58.7	60.7	59.7	60.0	57.5		0.69	0.74	0.73	1.11	0.69	0.72	0.78	0.75	0.75	0.68	0.76	0.12
5GY6/9	7	62.1	62.5	62.3	65.1	66.2	66.6	64.2	63.9	64.5	62.1		0.68	0.69	0.68	0.78	0.83	0.84	0.74	0.73	0.75	0.66	0.74	0.06
10GY6/10	8	59.2	58.3	60.3	64.7	64.7	64.5	66.7	64.5	65.3	63.2		0.55	0.52	0.59	0.74	0.74	0.73	0.82	0.73	0.76	0.68	0.69	0.10
5G5/10	9	65.2	63.2	62.1	66.0	63.5	65.0	67.6	68.3	67.9	67.5		0.57	0.49	0.45	0.60	0.50	0.56	0.66	0.69	0.67	0.65	0.58	0.08
10G5/10	10	67.1	65.7	65.6	68.5	68.9	69.6	69.2	69.4	68.1	66.0		0.61	0.56	0.55	0.67	0.69	0.72	0.70	0.70	0.64	0.56	0.64	0.06
5BG4/9	11	71.5	70.8	70.2	72.1	74.0	72.9	73.4	73.9	72.5	72.4		0.60	0.57	0.54	0.62	0.72	0.67	0.69	0.72	0.64	0.63	0.64	0.06
10BG4/9	12	72.5	70.8	71.7	74.2	73.5	73.6	74.2	74.0	73.6	72.9		0.63	0.55	0.59	0.72	0.68	0.69	0.71	0.70	0.68	0.64	0.66	0.06
5B4/9	13	72.3	72.7	73.7	74.0	74.2	73.6	74.1	74.6	73.0	73.2		0.62	0.64	0.69	0.70	0.71	0.68	0.70	0.73	0.64	0.65	0.68	0.04
10B4/10	14	69.6	68.1	68.5	70.3	71.9	73.0	74.7	75.1	73.6	72.5		0.48	0.41	0.43	0.51	0.59	0.64	0.73	0.75	0.67	0.61	0.58	0.12
5PB4/10	15	70.7	72.5	71.5	73.2	73.8	72.1	74.2	72.8	73.1	73.3		0.56	0.65	0.60	0.68	0.71	0.62	0.73	0.65	0.67	0.68	0.65	0.05
10PB4/10	16	69.2	70.2	71.6	71.2	72.0	71.4	73.6	72.4	72.5	71.7		0.53	0.58	0.65	0.62	0.66	0.63	0.74	0.68	0.68	0.64	0.64	0.06
5P4/10	17	67.1	70.5	69.2	71.5	71.6	71.5	72.7	72.8	70.0	70.7		0.47	0.63	0.57	0.67	0.67	0.67	0.73	0.73	0.59	0.62	0.63	0.08
10P4/10	18	68.6	66.5	67.4	71.9	70.9	70.5	72.5	71.3	71.1	69.3		0.56	0.47	0.50	0.71	0.66	0.64	0.73	0.67	0.66	0.58	0.62	0.09
5RP4/10	19	68.9	68.8	67.6	69.3	69.2	69.4	72.1	70.9	70.2	68.9		0.60	0.59	0.54	0.61	0.60	0.61	0.74	0.68	0.64	0.58	0.62	0.06
10RP4/10	20	67.2	66.4	67.0	68.6	66.9	70.1	70.8	70.3	68.3	66.5		0.53	0.50	0.52	0.58	0.51	0.65	0.68	0.66	0.56	0.49	0.57	0.07
10RP3/8	21	73.6	73.8	73.5	73.2	74.6	73.1	72.2	73.0	72.4	73.4		0.57	0.58	0.56	0.53	0.60	0.52	0.48	0.52	0.49	0.54	0.54	0.04
5R5/6	22	66.5	66.5	68.6	68.2	67.2	66.0	68.2	68.0	67.8	66.4		0.70	0.70	0.79	0.76	0.71	0.66	0.76	0.75	0.74	0.68	0.73	0.04
10R3/4	23	76.5	81.6	80.2	73.6	74.2	73.6	73.5	74.0	71.2	75.5		0.65	0.67	0.66	0.55	0.58	0.55	0.54	0.57	0.42	0.62	0.58	0.07
5YR5/6	24	67.4	65.6	65.5	69.0	68.9	66.5	68.9	69.3	67.1	67.0		0.74	0.67	0.66	0.79	0.79	0.69	0.79	0.81	0.71	0.71	0.73	0.06
5Y5/6	25	66.1	65.6	67.6	66.0	65.2	66.2	70.0	68.8	68.5	67.4		0.68	0.66	0.74	0.66	0.62	0.66	0.83	0.78	0.76	0.71	0.71	0.07
5Y4/6	26	71.6	71.7	72.0	71.0	71.2	71.5	72.9	71.5	72.3	73.7		0.68	0.69	0.70	0.64	0.65	0.66	0.73	0.66	0.70	0.77	0.69	0.04
5GY5/6	27	68.7	67.5	68.8	68.5	68.8	69.0	69.8	70.3	69.2	67.8		0.77	0.72	0.77	0.74	0.76	0.76	0.80	0.83	0.77	0.71	0.76	0.04
5G5/6	28	67.7	68.5	68.5	68.1	66.0	67.8	69.0	68.2	68.6	68.9		0.69	0.72	0.72	0.69	0.60	0.67	0.73	0.69	0.71	0.72	0.70	0.04
5BG5/6	29	68.3	68.2	68.9	68.2	68.1	66.9	69.2	68.3	69.1	68.9		0.69	0.68	0.71	0.67	0.66	0.61	0.71	0.67	0.71	0.70	0.68	0.03
5B5/6	30	68.6	67.7	69.3	69.7	67.9	68.4	71.2	69.7	68.7	66.9		0.72	0.68	0.75	0.75	0.67	0.69	0.82	0.75	0.70	0.63	0.72	0.06
5PB5/6	31	68.1	68.5	68.2	69.6	69.8	70.2	69.6	68.2	69.1	68.2		0.71	0.72	0.71	0.75	0.76	0.78	0.76	0.69	0.73	0.69	0.73	0.03
5P5/6	32	69.2	68.5	67.9	63.5	63.2	63.2	67.9	68.0	66.7	65.6		0.78	0.75	0.73	0.53	0.52	0.52	0.71	0.72	0.66	0.61	0.65	0.10
5RP5/6	33	66.8	64.5	66.8	70.2	67.0	66.8	68.0	67.2	64.8	66.5		0.71	0.62	0.71	0.84	0.70	0.69	0.75	0.71	0.61	0.68	0.70	0.06
5R5/3	34	67.5	67.1	68.0	66.7	65.5	65.9	66.2	65.2	69.2	67.5		0.72	0.70	0.74	0.66	0.62	0.63	0.65	0.61	0.77	0.70	0.68	0.05
5Y5/3	35	68.7	67.3	68.1	68.5	69.6	68.6	69.2	68.5	67.9	68.5		0.78	0.72	0.76	0.76	0.81	0.76	0.79	0.76	0.73	0.76	0.76	0.03
5G5/3	36	67.8	67.6	68.3	70.0	68.5	68.6	69.1	69.0	67.5	66.5		0.71	0.70	0.73	0.79	0.72	0.73	0.75	0.75	0.68	0.64	0.72	0.04
5B5/3	37	68.7	68.3	68.5	69.7	69.1	69.3	69.7	69.3	68.8	69.0		0.74	0.73	0.74	0.77	0.74	0.75	0.77	0.76	0.73	0.74	0.75	0.02
5P5/3	38	68.5	68.2	67.8	68.2	66.5	67.9	68.4	69.2	68.3	66.7		0.74	0.73	0.71	0.71	0.64	0.70	0.72	0.76	0.71	0.65	0.71	0.04
N5	39	62.6	63.1	63.9	65.8	66.7	67.2	68.9	69.0	70.0	67.5		0.50	0.52	0.55	0.62	0.65	0.67	0.74	0.75	0.79	0.68	0.65	0.10

APPENDIX F

The spectral distribution data and graph of the color chart and the spectral distribution data of the subject in the observer's room.

Table F-1 The spectral distribution data of 5R4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.89E-07	1.37E-07	6.81E-07		584	3.78E-06	9.02E-06	4.76E-05	4.79E-05
384	1.09E-07	7.11E-07	1.12E-07	7.95E-07		588	4.60E-06	1.09E-05	5.34E-05	5.84E-05
388	9.16E-08	2.80E-07	9.45E-08	1.02E-06		592	3.89E-06	1.29E-05	4.40E-05	6.85E-05
392	7.96E-08	8.43E-08	8.22E-08	1.43E-06		596	2.34E-06	1.45E-05	3.23E-05	7.77E-05
396	7.47E-08	7.47E-08	3.00E-07	2.77E-06		600	1.66E-06	1.61E-05	2.53E-05	8.60E-05
400	6.86E-08	1.31E-07	1.80E-06	2.55E-06		604	2.91E-06	1.77E-05	3.85E-05	9.26E-05
404	6.21E-08	1.70E-07	2.69E-06	2.68E-06		608	1.57E-05	1.90E-05	1.64E-04	9.68E-05
408	5.81E-08	1.53E-07	1.69E-06	2.65E-06		612	2.37E-05	1.93E-05	2.43E-04	9.85E-05
412	5.67E-08	4.54E-07	8.18E-07	2.91E-06		616	1.65E-05	1.92E-05	1.68E-04	9.99E-05
416	5.58E-08	7.35E-07	7.25E-07	2.98E-06		620	8.59E-06	1.87E-05	9.51E-05	1.00E-04
420	5.33E-08	4.83E-07	2.23E-06	2.97E-06		624	5.62E-06	1.85E-05	6.60E-05	9.95E-05
424	5.01E-08	1.52E-07	3.80E-06	3.89E-06		628	4.65E-06	1.85E-05	5.59E-05	9.81E-05
428	1.47E-07	5.81E-07	8.40E-06	4.12E-06		632	3.12E-06	1.85E-05	4.18E-05	9.67E-05
432	1.09E-06	8.05E-07	2.18E-05	4.04E-06		636	7.11E-07	1.83E-05	2.05E-05	9.51E-05
436	1.62E-06	8.86E-07	2.77E-05	4.19E-06		640	4.03E-08	1.83E-05	1.02E-05	9.32E-05
440	8.35E-07	3.42E-07	1.79E-05	4.52E-06		644	4.15E-08	1.75E-05	9.92E-06	9.12E-05
444	4.71E-07	7.88E-07	1.09E-05	4.89E-06		648	1.65E-07	1.74E-05	1.45E-05	9.12E-05
448	2.82E-07	6.50E-07	1.01E-05	4.93E-06		652	2.08E-07	1.71E-05	1.52E-05	9.05E-05
452	4.09E-08	7.28E-07	1.03E-05	5.23E-06		656	4.62E-08	1.73E-05	1.06E-05	8.90E-05
456	1.37E-07	9.45E-07	9.74E-06	5.63E-06		660	4.79E-08	1.68E-05	9.80E-06	8.70E-05
460	1.88E-07	1.11E-06	9.03E-06	6.08E-06		664	4.96E-08	1.60E-05	1.05E-05	8.51E-05
464	2.58E-07	8.31E-07	8.46E-06	6.12E-06		668	5.11E-08	1.55E-05	9.37E-06	8.20E-05
468	1.28E-07	9.56E-07	7.93E-06	6.29E-06		672	5.25E-08	1.48E-05	7.80E-06	7.86E-05
472	3.82E-08	9.87E-07	7.14E-06	6.21E-06		676	5.40E-08	1.40E-05	6.70E-06	7.59E-05
476	3.71E-08	4.26E-07	7.27E-06	6.21E-06		680	5.56E-08	1.40E-05	6.30E-06	7.22E-05
480	1.67E-07	6.53E-07	9.86E-06	6.31E-06		684	5.73E-08	1.34E-05	6.98E-06	6.90E-05
484	5.47E-07	8.30E-07	1.50E-05	6.55E-06		688	5.92E-08	1.24E-05	7.37E-06	6.51E-05
488	6.03E-07	8.31E-07	1.80E-05	6.60E-06		692	6.12E-08	1.15E-05	5.94E-06	6.13E-05
492	8.06E-07	1.02E-06	1.59E-05	6.95E-06		696	6.40E-08	1.02E-05	3.10E-06	5.77E-05
496	2.75E-07	1.25E-06	1.13E-05	7.10E-06		700	6.74E-08	1.02E-05	3.88E-06	5.43E-05
500	3.54E-08	7.61E-07	7.49E-06	6.67E-06		704	7.09E-08	9.87E-06	1.42E-05	5.14E-05
504	3.48E-08	1.23E-06	4.96E-06	6.71E-06		708	7.50E-08	7.85E-06	2.60E-05	4.83E-05
508	3.43E-08	1.37E-06	3.38E-06	6.74E-06		712	8.05E-08	7.67E-06	2.17E-05	4.63E-05
512	3.38E-08	8.95E-07	3.17E-06	6.93E-06		716	8.59E-08	7.41E-06	8.15E-06	4.47E-05
516	3.37E-08	1.23E-06	3.08E-06	7.26E-06		720	9.16E-08	7.10E-06	8.96E-07	4.17E-05
520	3.36E-08	9.26E-07	2.46E-06	7.12E-06		724	9.77E-08	5.56E-06	1.01E-07	3.86E-05
524	3.39E-08	7.50E-07	2.08E-06	7.14E-06		728	1.04E-07	4.70E-06	1.08E-07	3.61E-05
528	3.43E-08	9.71E-07	1.99E-06	7.26E-06		732	1.10E-07	4.25E-06	1.14E-07	3.37E-05
532	3.43E-08	1.45E-06	2.60E-06	7.20E-06		736	1.17E-07	4.05E-06	1.21E-07	3.02E-05
536	1.64E-07	1.44E-06	9.54E-06	7.08E-06		740	1.23E-07	3.41E-06	1.27E-07	2.71E-05
540	1.93E-06	1.20E-06	3.18E-05	7.20E-06		744	1.30E-07	2.43E-06	1.34E-07	2.49E-05
544	3.69E-06	1.17E-06	4.81E-05	7.67E-06		748	1.38E-07	1.80E-06	1.42E-07	2.21E-05
548	2.55E-06	1.51E-06	3.26E-05	7.97E-06		752	1.46E-07	1.10E-06	1.51E-07	1.94E-05
552	9.46E-07	1.58E-06	1.49E-05	8.66E-06		756	1.57E-07	2.25E-07	1.63E-07	1.73E-05
556	3.22E-08	1.47E-06	5.42E-06	9.69E-06		760	1.71E-07	1.71E-07	1.76E-07	1.45E-05
560	3.27E-08	1.54E-06	2.04E-06	1.17E-05		764	1.85E-07	1.85E-07	1.91E-07	1.36E-05
564	3.31E-08	2.34E-06	1.19E-06	1.48E-05		768	2.01E-07	2.01E-07	2.07E-07	1.10E-05
568	3.34E-08	3.34E-06	1.78E-06	1.85E-05		772	2.24E-07	2.24E-07	2.31E-07	6.70E-06
572	3.34E-08	4.29E-06	4.00E-06	2.42E-05		776	2.47E-07	2.47E-07	2.55E-07	5.24E-06
576	5.53E-07	5.58E-06	1.34E-05	3.11E-05		780	2.77E-07	2.77E-07	2.86E-07	2.69E-06
580	1.96E-06	7.33E-06	2.92E-05	3.87E-05						

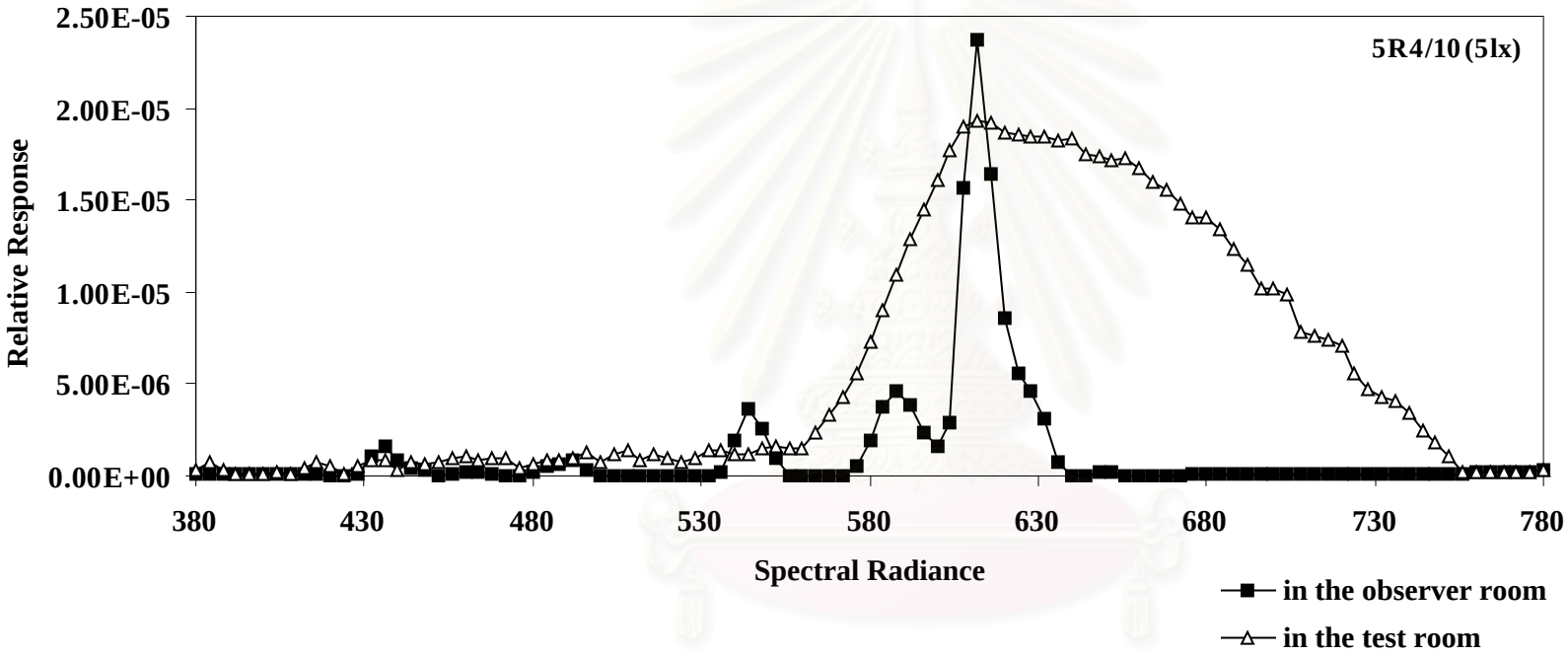


Fig.F-1a Compairison between the spatral of the color chart 5R4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

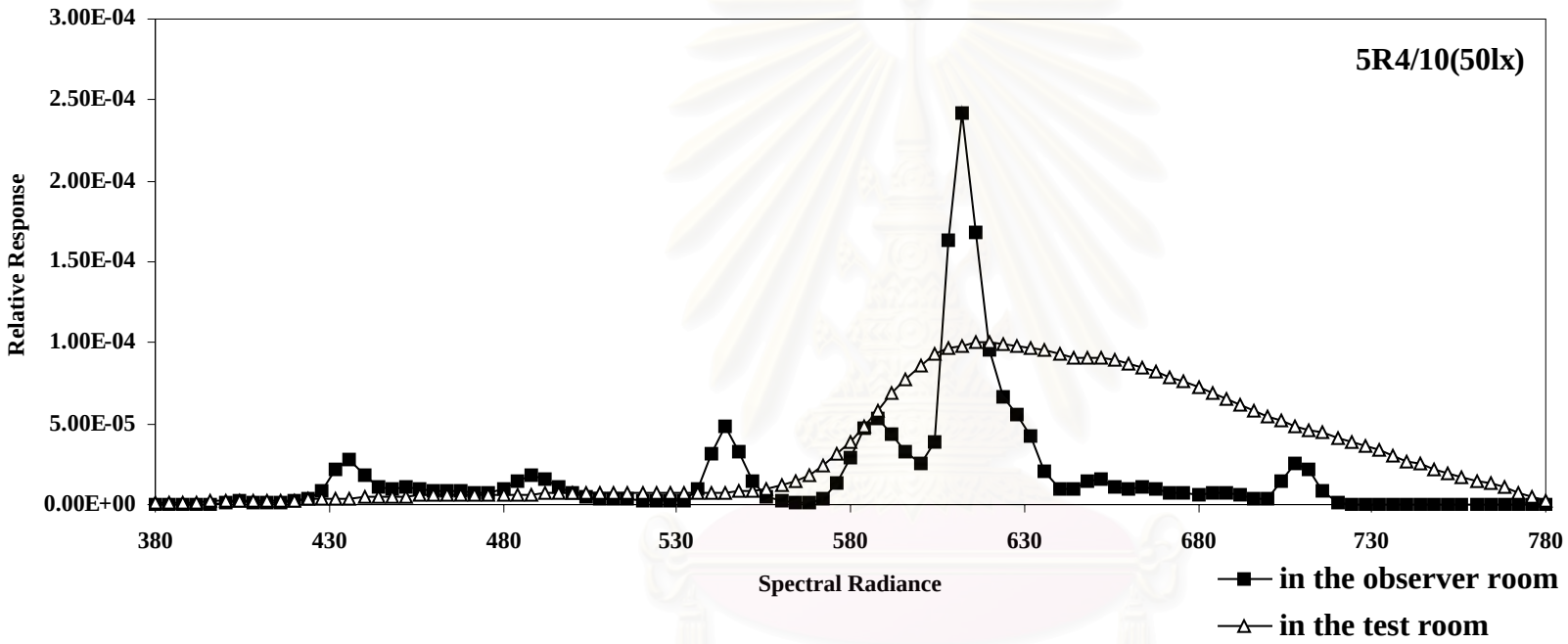


Fig.F-1b Compairison between the spatral of the color chart 5R4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-2 The spectral distribution data of 10R4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.43E-07	1.33E-07	1.88E-07		584	4.52E-06	1.10E-05	4.91E-05	5.92E-05
384	1.09E-07	1.09E-07	1.09E-07	1.86E-07		588	5.52E-06	1.28E-05	5.39E-05	6.89E-05
388	9.16E-08	9.16E-08	3.93E-07	1.24E-06		592	4.12E-06	1.44E-05	4.32E-05	7.72E-05
392	7.96E-08	7.96E-08	1.03E-07	3.19E-07		596	2.72E-06	1.56E-05	3.05E-05	8.49E-05
396	7.47E-08	7.47E-08	2.57E-07	5.37E-07		600	2.05E-06	1.65E-05	2.30E-05	9.11E-05
400	6.86E-08	6.86E-08	6.86E-07	4.66E-07		604	3.33E-06	1.77E-05	3.43E-05	9.58E-05
404	6.21E-08	6.21E-08	8.31E-07	5.11E-07		608	1.44E-05	1.87E-05	1.46E-04	9.88E-05
408	5.81E-08	5.81E-08	6.66E-07	6.55E-07		612	2.20E-05	1.90E-05	2.16E-04	9.97E-05
412	5.67E-08	5.67E-08	3.02E-07	1.34E-06		616	1.55E-05	1.89E-05	1.49E-04	1.01E-04
416	5.58E-08	1.89E-07	6.33E-07	1.47E-06		620	8.54E-06	1.89E-05	8.37E-05	1.00E-04
420	5.33E-08	3.93E-07	7.91E-07	1.69E-06		624	5.85E-06	1.88E-05	5.79E-05	9.91E-05
424	5.01E-08	5.86E-08	2.06E-06	2.04E-06		628	4.56E-06	1.82E-05	4.85E-05	9.75E-05
428	9.05E-08	8.17E-08	4.46E-06	1.89E-06		632	3.19E-06	1.76E-05	3.60E-05	9.58E-05
432	3.06E-07	2.45E-07	1.09E-05	1.79E-06		636	1.32E-06	1.75E-05	1.72E-05	9.36E-05
436	6.63E-07	5.57E-07	1.44E-05	1.86E-06		640	4.06E-07	1.76E-05	8.40E-06	9.21E-05
440	5.99E-07	5.27E-07	9.40E-06	2.33E-06		644	2.87E-07	1.72E-05	8.88E-06	9.00E-05
444	3.04E-07	5.17E-07	5.93E-06	2.87E-06		648	5.64E-07	1.70E-05	1.28E-05	9.00E-05
448	5.39E-08	2.50E-07	5.43E-06	2.71E-06		652	4.28E-07	1.66E-05	1.28E-05	8.94E-05
452	6.63E-08	4.09E-08	5.06E-06	3.27E-06		656	2.74E-07	1.68E-05	8.92E-06	8.76E-05
456	1.20E-07	4.04E-08	4.94E-06	3.10E-06		660	1.62E-07	1.61E-05	7.61E-06	8.57E-05
460	4.02E-08	2.12E-07	4.79E-06	2.80E-06		664	2.27E-07	1.58E-05	8.60E-06	8.30E-05
464	6.41E-08	2.28E-07	4.51E-06	3.01E-06		668	5.11E-08	1.50E-05	7.19E-06	8.04E-05
468	4.90E-08	5.89E-08	4.51E-06	3.10E-06		672	5.25E-08	1.40E-05	5.64E-06	7.80E-05
472	3.82E-08	3.82E-08	4.14E-06	3.27E-06		676	5.40E-08	1.37E-05	4.79E-06	7.44E-05
476	3.71E-08	1.44E-07	4.07E-06	3.68E-06		680	5.56E-08	1.30E-05	5.02E-06	7.11E-05
480	1.89E-07	7.49E-07	5.50E-06	3.88E-06		684	5.73E-08	1.20E-05	5.80E-06	6.78E-05
484	7.77E-07	1.04E-06	9.12E-06	4.21E-06		688	5.92E-08	1.13E-05	6.22E-06	6.43E-05
488	9.08E-07	1.03E-06	1.15E-05	4.69E-06		692	6.12E-08	1.11E-05	4.48E-06	6.06E-05
492	8.40E-07	6.79E-07	1.04E-05	5.19E-06		696	6.40E-08	1.06E-05	1.52E-06	5.65E-05
496	5.76E-07	4.51E-07	8.00E-06	5.01E-06		700	6.74E-08	9.55E-06	2.44E-06	5.37E-05
500	4.61E-08	2.23E-07	5.09E-06	4.82E-06		704	7.09E-08	8.74E-06	1.20E-05	5.07E-05
504	8.38E-08	4.95E-07	3.21E-06	5.14E-06		708	7.50E-08	8.19E-06	2.15E-05	4.80E-05
508	3.43E-08	1.10E-06	2.84E-06	5.56E-06		712	8.05E-08	7.59E-06	1.73E-05	4.47E-05
512	3.38E-08	7.59E-07	2.22E-06	5.85E-06		716	8.59E-08	7.08E-06	5.79E-06	4.22E-05
516	3.37E-08	6.36E-07	1.67E-06	5.74E-06		720	9.16E-08	6.31E-06	4.80E-07	4.01E-05
520	3.36E-08	1.09E-06	1.89E-06	6.39E-06		724	9.77E-08	5.64E-06	9.77E-08	3.77E-05
524	3.39E-08	1.02E-06	1.50E-06	6.44E-06		728	1.04E-07	5.13E-06	1.04E-07	3.43E-05
528	3.43E-08	8.56E-07	1.41E-06	6.63E-06		732	1.10E-07	4.79E-06	1.10E-07	3.17E-05
532	3.43E-08	7.38E-07	2.23E-06	6.90E-06		736	1.17E-07	3.79E-06	1.17E-07	2.95E-05
536	2.73E-07	1.03E-06	7.76E-06	7.10E-06		740	1.23E-07	2.12E-06	1.23E-07	2.57E-05
540	2.07E-06	1.30E-06	2.68E-05	7.18E-06		744	1.30E-07	1.75E-06	1.30E-07	2.36E-05
544	3.83E-06	1.28E-06	4.17E-05	8.00E-06		748	1.38E-07	2.26E-06	1.38E-07	2.05E-05
548	2.68E-06	1.67E-06	2.84E-05	9.06E-06		752	1.46E-07	2.56E-06	1.46E-07	1.90E-05
552	8.82E-07	1.87E-06	1.29E-05	1.07E-05		756	1.57E-07	6.66E-07	1.57E-07	1.47E-05
556	1.01E-07	2.16E-06	4.78E-06	1.25E-05		760	1.71E-07	1.35E-06	1.71E-07	1.25E-05
560	3.27E-08	2.77E-06	1.97E-06	1.56E-05		764	1.85E-07	4.28E-07	1.85E-07	1.01E-05
564	3.31E-08	3.61E-06	1.07E-06	2.02E-05		768	2.01E-07	2.01E-07	2.01E-07	9.08E-06
568	3.34E-08	4.57E-06	1.25E-06	2.64E-05		772	2.24E-07	2.24E-07	2.24E-07	6.57E-06
572	1.34E-07	5.87E-06	4.58E-06	3.34E-05		776	2.47E-07	2.47E-07	2.47E-07	5.59E-06
576	8.00E-07	7.33E-06	1.46E-05	4.15E-05		780	2.77E-07	2.77E-07	2.77E-07	2.52E-06
580	2.58E-06	8.85E-06	3.14E-05	4.99E-05						

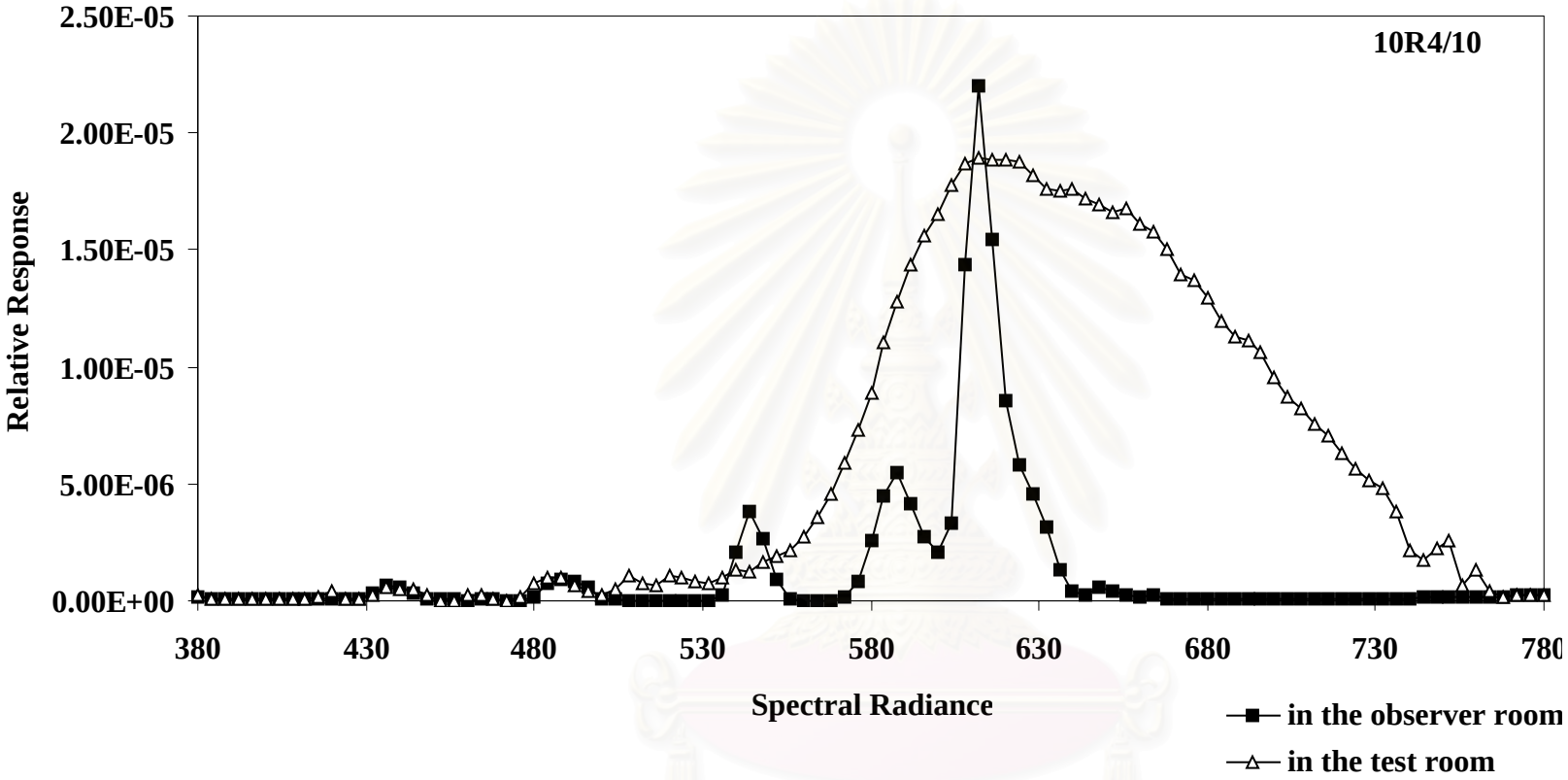


Fig.F-2a Compairison between the spatral of the color chart 10R4/10 measured at the border of RVSI
in the test room and at 5 lux in the observer room.

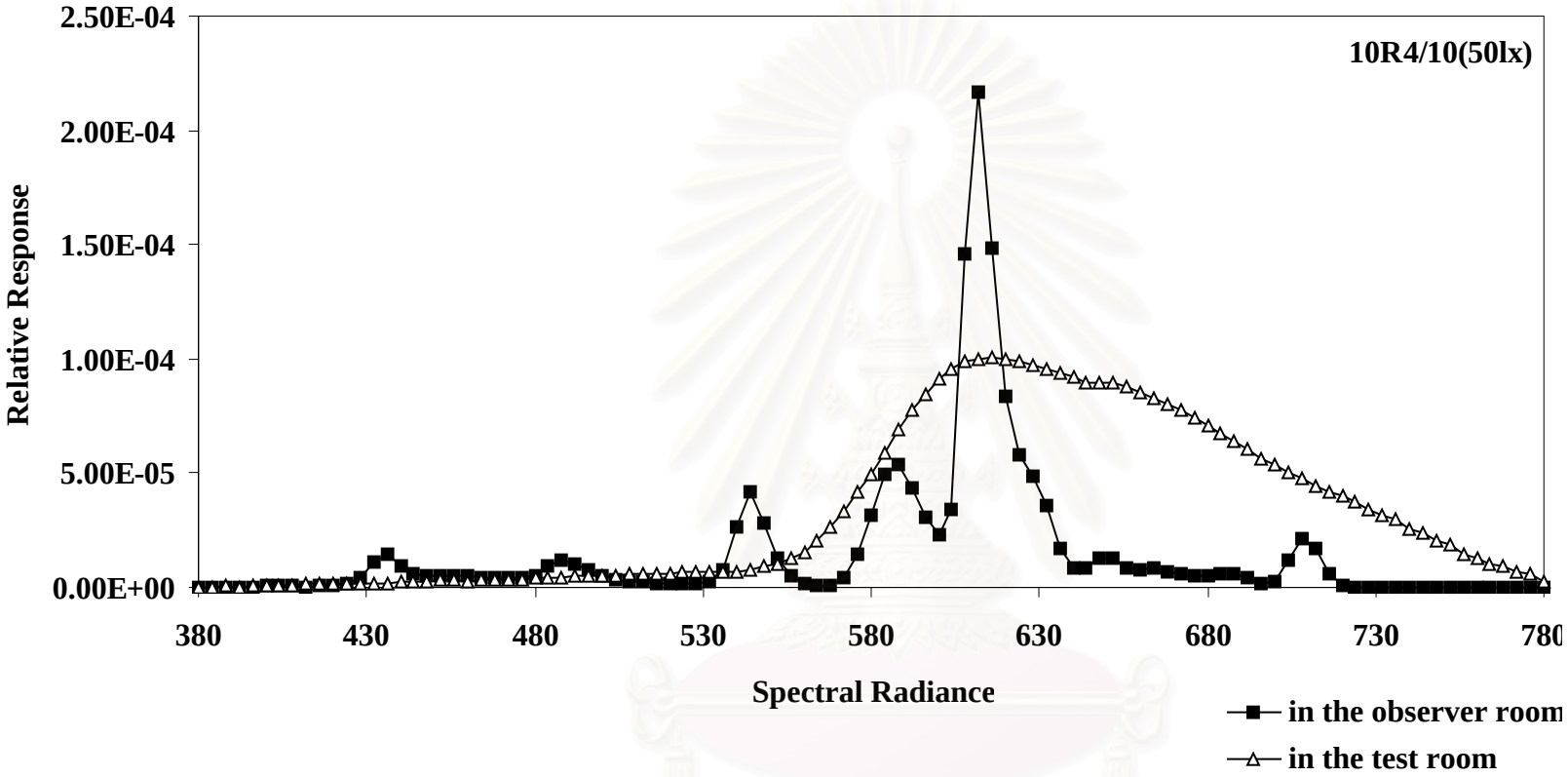


Fig.F-2b Compairison between the spatral of the color chart 10R4/10 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-3 The spectral distribution data of 5YR5/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.43E-07	1.33E-07	1.33E-07		584	6.06E-06	1.08E-05	6.95E-05	7.14E-05
384	1.09E-07	1.09E-07	1.09E-07	1.09E-07		588	6.82E-06	1.20E-05	7.36E-05	7.92E-05
388	9.16E-08	9.16E-08	2.42E-07	6.19E-07		592	4.97E-06	1.31E-05	5.75E-05	8.56E-05
392	7.96E-08	7.96E-08	8.90E-08	1.12E-07		596	3.22E-06	1.39E-05	4.00E-05	9.12E-05
396	7.47E-08	7.47E-08	7.47E-08	1.15E-07		600	2.03E-06	1.49E-05	2.99E-05	9.59E-05
400	6.86E-08	6.86E-08	3.79E-07	4.40E-07		604	3.53E-06	1.56E-05	4.29E-05	9.96E-05
404	6.21E-08	6.21E-08	1.13E-06	6.67E-07		608	1.72E-05	1.60E-05	1.78E-04	1.01E-04
408	5.81E-08	5.81E-08	5.86E-07	5.86E-07		612	2.64E-05	1.62E-05	2.62E-04	1.01E-04
412	5.67E-08	5.67E-08	5.67E-08	1.00E-06		616	1.79E-05	1.64E-05	1.81E-04	1.02E-04
416	5.58E-08	5.58E-08	4.54E-07	1.26E-06		620	9.76E-06	1.64E-05	1.02E-04	1.01E-04
420	5.33E-08	5.33E-08	7.18E-07	1.27E-06		624	6.51E-06	1.62E-05	6.97E-05	9.90E-05
424	5.01E-08	5.01E-08	1.72E-06	9.86E-07		628	4.73E-06	1.56E-05	5.87E-05	9.77E-05
428	1.19E-07	4.80E-08	4.50E-06	1.03E-06		632	3.28E-06	1.49E-05	4.36E-05	9.59E-05
432	5.19E-07	1.86E-07	1.15E-05	1.44E-06		636	7.55E-07	1.49E-05	2.11E-05	9.41E-05
436	4.46E-07	1.90E-07	1.43E-05	1.52E-06		640	4.03E-08	1.47E-05	1.08E-05	9.20E-05
440	3.52E-07	3.54E-07	9.53E-06	2.00E-06		644	4.15E-08	1.43E-05	1.09E-05	9.08E-05
444	1.18E-07	4.46E-07	6.22E-06	2.08E-06		648	1.50E-07	1.39E-05	1.54E-05	8.97E-05
448	4.20E-08	1.73E-07	5.84E-06	1.86E-06		652	1.88E-07	1.40E-05	1.56E-05	8.90E-05
452	4.09E-08	4.09E-08	5.51E-06	2.01E-06		656	4.62E-08	1.36E-05	1.13E-05	8.77E-05
456	5.42E-08	4.04E-08	5.52E-06	2.32E-06		660	4.79E-08	1.33E-05	1.03E-05	8.53E-05
460	6.13E-08	4.02E-08	5.03E-06	2.31E-06		664	4.96E-08	1.25E-05	1.06E-05	8.30E-05
464	2.10E-07	3.98E-08	4.79E-06	2.54E-06		668	5.11E-08	1.25E-05	9.68E-06	8.03E-05
468	3.71E-07	2.43E-07	4.64E-06	3.12E-06		672	5.25E-08	1.25E-05	7.98E-06	7.72E-05
472	7.83E-08	4.36E-07	4.56E-06	3.26E-06		676	5.40E-08	1.14E-05	7.22E-06	7.44E-05
476	3.71E-08	2.29E-07	5.16E-06	3.91E-06		680	5.56E-08	1.17E-05	7.25E-06	7.03E-05
480	1.46E-07	2.56E-07	7.14E-06	3.77E-06		684	5.73E-08	1.12E-05	7.26E-06	6.72E-05
484	4.59E-07	4.10E-07	1.15E-05	4.49E-06		688	5.92E-08	1.02E-05	8.00E-06	6.36E-05
488	6.41E-07	3.60E-07	1.47E-05	5.19E-06		692	6.12E-08	9.30E-06	6.61E-06	5.98E-05
492	7.94E-07	1.53E-07	1.40E-05	5.94E-06		696	6.40E-08	9.05E-06	2.72E-06	5.66E-05
496	7.87E-07	3.01E-07	1.14E-05	7.07E-06		700	6.74E-08	8.35E-06	3.11E-06	5.40E-05
500	1.66E-07	8.70E-07	7.65E-06	8.86E-06		704	7.09E-08	8.14E-06	1.43E-05	5.09E-05
504	8.38E-08	9.85E-07	6.30E-06	1.04E-05		708	7.50E-08	7.74E-06	2.71E-05	4.82E-05
508	3.43E-08	1.31E-06	5.99E-06	1.21E-05		712	8.05E-08	6.37E-06	2.25E-05	4.56E-05
512	3.38E-08	1.89E-06	6.03E-06	1.38E-05		716	8.59E-08	6.56E-06	8.49E-06	4.32E-05
516	3.37E-08	2.49E-06	5.69E-06	1.57E-05		720	9.16E-08	5.88E-06	1.01E-06	4.01E-05
520	3.36E-08	2.70E-06	4.97E-06	1.71E-05		724	9.77E-08	5.41E-06	9.77E-08	3.82E-05
524	3.39E-08	2.47E-06	4.55E-06	1.87E-05		728	1.04E-07	3.35E-06	1.04E-07	3.40E-05
528	3.43E-08	2.75E-06	4.72E-06	1.94E-05		732	1.10E-07	2.43E-06	1.10E-07	3.17E-05
532	3.43E-08	2.78E-06	6.36E-06	1.99E-05		736	1.17E-07	2.06E-06	1.17E-07	2.90E-05
536	1.16E-06	2.90E-06	2.00E-05	2.03E-05		740	1.23E-07	4.83E-07	1.23E-07	2.56E-05
540	6.13E-06	3.43E-06	6.57E-05	2.08E-05		744	1.30E-07	8.27E-07	1.30E-07	2.13E-05
544	9.59E-06	3.85E-06	1.00E-04	2.23E-05		748	1.38E-07	2.08E-07	1.38E-07	1.93E-05
548	6.09E-06	3.56E-06	6.74E-05	2.33E-05		752	1.46E-07	1.46E-07	1.46E-07	1.76E-05
552	2.49E-06	3.82E-06	3.12E-05	2.50E-05		756	1.57E-07	1.57E-07	1.57E-07	1.48E-05
556	5.66E-07	4.39E-06	1.25E-05	2.78E-05		760	1.71E-07	1.71E-07	1.71E-07	1.22E-05
560	3.27E-08	4.99E-06	5.45E-06	3.16E-05		764	1.85E-07	1.85E-07	1.85E-07	1.07E-05
564	3.31E-08	5.53E-06	3.73E-06	3.65E-05		768	2.01E-07	2.01E-07	2.01E-07	8.21E-06
568	3.34E-08	6.38E-06	3.92E-06	4.29E-05		772	2.24E-07	2.24E-07	2.24E-07	4.06E-06
572	3.34E-08	7.53E-06	8.19E-06	4.93E-05		776	2.47E-07	2.47E-07	2.47E-07	5.33E-06
576	1.07E-06	8.69E-06	2.22E-05	5.66E-05		780	2.77E-07	2.77E-07	2.77E-07	4.17E-06
580	3.49E-06	9.77E-06	4.57E-05	6.41E-05						

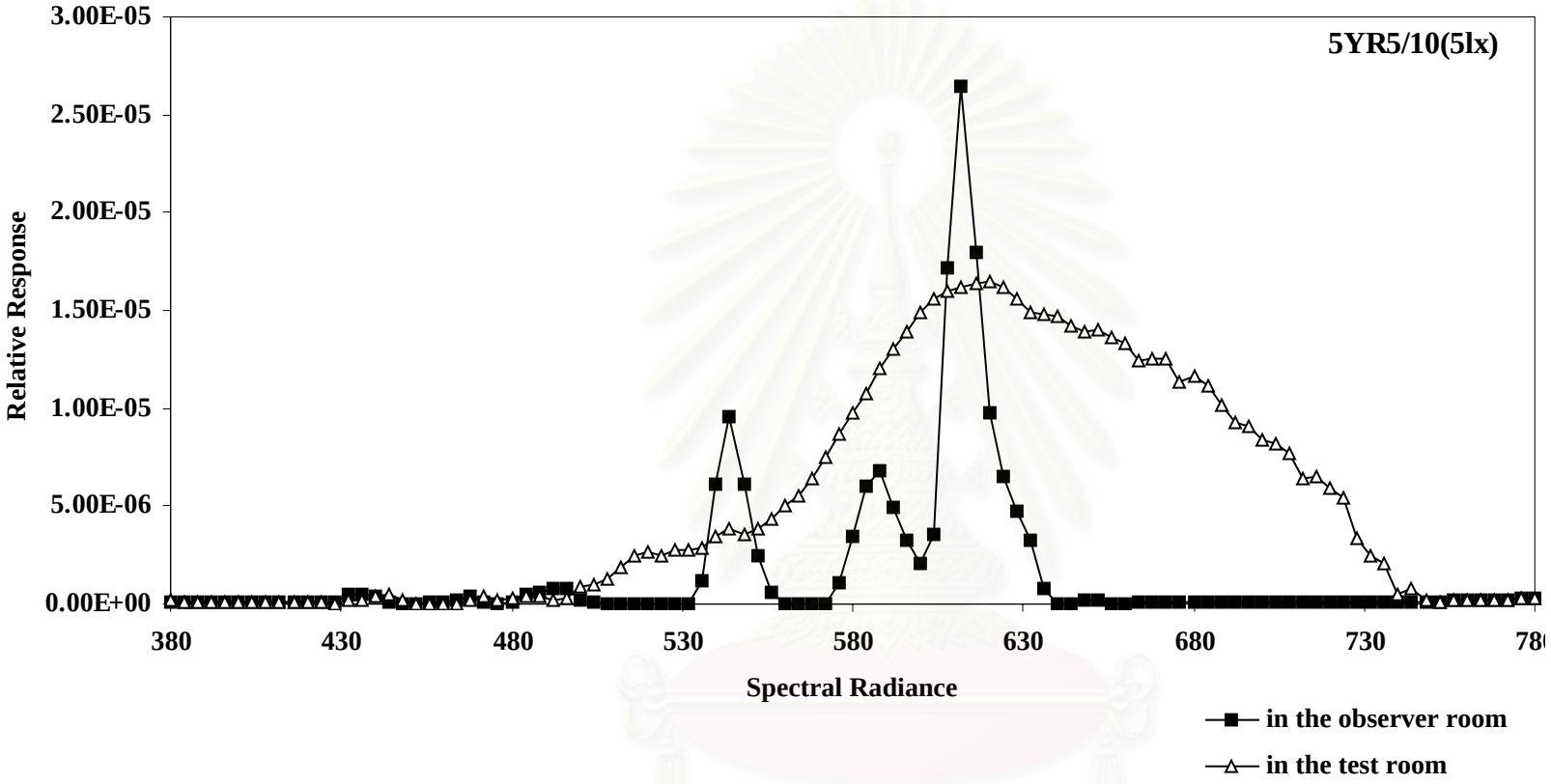


Fig.F-3a Compairison between the spatral of the color chart 5YR5/10 measured at the border of RVSI in the test room and at 5 lux in the observer room.

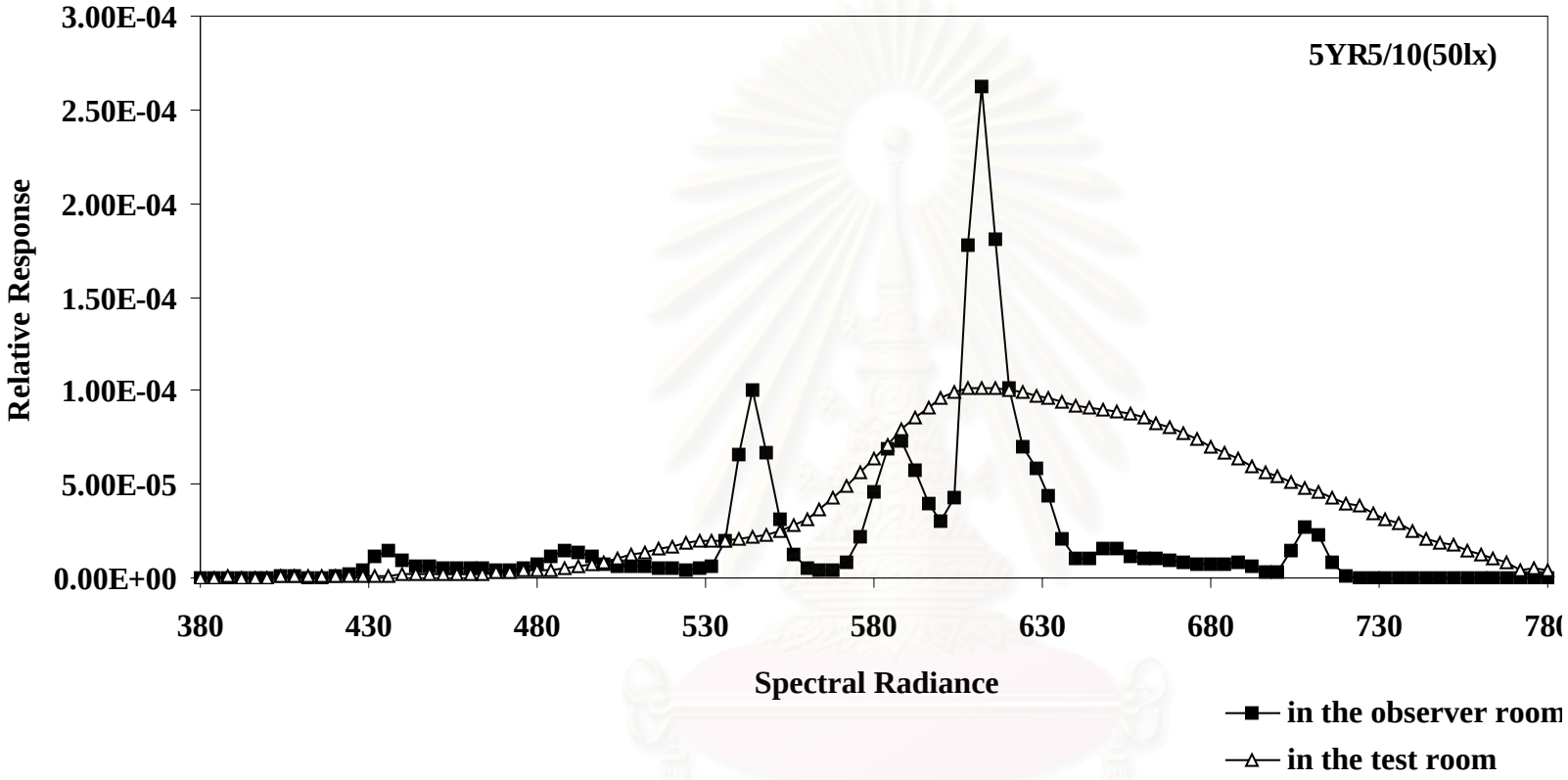


Fig.F-3b Compairison between the spatral of the color chart 5YR5/10 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-4 The spectral distribution data of 10YR6/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.00E-07	1.33E-07		584	8.50E-06	1.13E-05	9.32E-05	7.63E-05
384	1.09E-07	1.09E-07	4.43E-07	1.09E-07		588	9.30E-06	1.20E-05	9.54E-05	8.03E-05
388	9.16E-08	9.16E-08	4.07E-07	2.42E-07		592	6.82E-06	1.23E-05	7.22E-05	8.42E-05
392	7.96E-08	1.50E-07	9.97E-08	8.90E-08		596	4.31E-06	1.28E-05	4.93E-05	8.77E-05
396	7.47E-08	7.47E-08	9.39E-08	2.77E-07		600	2.90E-06	1.34E-05	3.61E-05	9.05E-05
400	6.86E-08	1.93E-07	6.96E-07	1.10E-06		604	3.97E-06	1.41E-05	5.07E-05	9.24E-05
404	6.21E-08	2.77E-07	1.65E-06	8.36E-07		608	2.02E-05	1.44E-05	2.06E-04	9.33E-05
408	5.81E-08	5.81E-08	8.88E-07	5.81E-07		612	3.11E-05	1.43E-05	3.04E-04	9.24E-05
412	5.67E-08	5.67E-08	4.02E-07	7.18E-07		616	2.10E-05	1.41E-05	2.09E-04	9.20E-05
416	5.58E-08	5.58E-08	9.68E-07	8.70E-07		620	1.15E-05	1.41E-05	1.17E-04	9.09E-05
420	5.33E-08	5.33E-08	1.91E-06	1.03E-06		624	7.31E-06	1.43E-05	8.06E-05	8.93E-05
424	5.01E-08	5.01E-08	2.14E-06	6.19E-07		628	5.81E-06	1.38E-05	6.83E-05	8.79E-05
428	4.80E-08	4.80E-08	4.84E-06	9.13E-07		632	3.71E-06	1.33E-05	5.08E-05	8.60E-05
432	2.85E-07	4.68E-08	1.19E-05	1.43E-06		636	8.87E-07	1.25E-05	2.48E-05	8.43E-05
436	4.20E-07	4.60E-08	1.54E-05	1.38E-06		640	4.03E-08	1.25E-05	1.24E-05	8.27E-05
440	1.48E-07	4.53E-08	1.06E-05	1.57E-06		644	4.15E-08	1.20E-05	1.29E-05	8.11E-05
444	5.20E-08	4.38E-08	7.38E-06	1.91E-06		648	3.79E-07	1.23E-05	1.78E-05	8.09E-05
448	3.34E-07	4.20E-08	6.52E-06	2.15E-06		652	4.95E-07	1.17E-05	1.81E-05	8.01E-05
452	4.09E-08	4.09E-08	6.58E-06	2.06E-06		656	4.62E-08	1.15E-05	1.36E-05	7.84E-05
456	4.04E-08	6.80E-08	6.34E-06	2.68E-06		660	4.79E-08	1.09E-05	1.23E-05	7.68E-05
460	4.02E-08	8.24E-08	6.19E-06	2.76E-06		664	4.96E-08	1.07E-05	1.32E-05	7.50E-05
464	3.98E-08	3.98E-08	6.32E-06	2.57E-06		668	5.11E-08	1.05E-05	1.13E-05	7.31E-05
468	3.91E-08	3.91E-08	6.14E-06	2.51E-06		672	5.25E-08	1.02E-05	9.16E-06	7.06E-05
472	3.82E-08	3.98E-08	5.88E-06	3.03E-06		676	5.40E-08	9.86E-06	8.59E-06	6.71E-05
476	6.67E-08	1.41E-07	6.27E-06	3.36E-06		680	5.56E-08	9.89E-06	9.67E-06	6.42E-05
480	2.30E-07	3.47E-07	8.25E-06	3.61E-06		684	5.73E-08	9.72E-06	9.82E-06	6.11E-05
484	5.20E-07	6.10E-07	1.37E-05	4.34E-06		688	5.92E-08	9.37E-06	9.43E-06	5.75E-05
488	9.42E-07	7.88E-07	1.82E-05	5.36E-06		692	6.12E-08	8.44E-06	8.11E-06	5.39E-05
492	7.96E-07	7.10E-07	1.79E-05	6.57E-06		696	6.40E-08	7.81E-06	5.00E-06	5.04E-05
496	4.98E-07	6.50E-07	1.46E-05	8.17E-06		700	6.74E-08	7.35E-06	6.03E-06	4.80E-05
500	3.16E-07	1.01E-06	1.10E-05	1.03E-05		704	7.09E-08	7.01E-06	1.82E-05	4.55E-05
504	8.38E-08	1.35E-06	9.26E-06	1.29E-05		708	7.50E-08	6.66E-06	3.20E-05	4.32E-05
508	6.46E-08	1.77E-06	9.19E-06	1.60E-05		712	8.05E-08	5.76E-06	2.61E-05	4.01E-05
512	1.81E-07	2.54E-06	9.35E-06	1.92E-05		716	8.59E-08	5.25E-06	1.11E-05	3.80E-05
516	4.09E-07	3.21E-06	9.95E-06	2.29E-05		720	9.16E-08	4.10E-06	1.83E-06	3.55E-05
520	8.61E-08	3.76E-06	9.95E-06	2.67E-05		724	9.77E-08	3.15E-06	1.04E-07	3.35E-05
524	8.92E-08	4.14E-06	9.35E-06	3.03E-05		728	1.04E-07	1.71E-06	1.11E-07	3.11E-05
528	3.43E-08	4.30E-06	9.69E-06	3.22E-05		732	1.10E-07	6.89E-07	1.17E-07	2.89E-05
532	3.85E-07	4.62E-06	1.35E-05	3.34E-05		736	1.17E-07	6.14E-07	1.24E-07	2.64E-05
536	3.14E-06	4.94E-06	4.05E-05	3.46E-05		740	1.23E-07	1.23E-07	1.31E-07	2.32E-05
540	1.25E-05	5.54E-06	1.29E-04	3.57E-05		744	1.30E-07	1.30E-07	1.39E-07	2.07E-05
544	1.98E-05	6.22E-06	1.95E-04	3.67E-05		748	1.38E-07	1.38E-07	1.46E-07	1.64E-05
548	1.31E-05	6.34E-06	1.32E-04	3.86E-05		752	1.46E-07	1.46E-07	1.56E-07	1.49E-05
552	5.45E-06	6.55E-06	6.13E-05	4.12E-05		756	1.57E-07	1.57E-07	1.68E-07	1.32E-05
556	1.52E-06	6.66E-06	2.47E-05	4.42E-05		760	1.71E-07	1.71E-07	1.82E-07	1.22E-05
560	1.81E-07	7.03E-06	1.10E-05	4.82E-05		764	1.85E-07	1.85E-07	1.97E-07	1.07E-05
564	3.31E-08	7.79E-06	7.43E-06	5.25E-05		768	2.01E-07	2.01E-07	2.14E-07	8.25E-06
568	3.34E-08	8.68E-06	6.79E-06	5.77E-05		772	2.24E-07	2.24E-07	2.38E-07	3.25E-06
572	2.73E-07	9.44E-06	1.25E-05	6.25E-05		776	2.47E-07	2.47E-07	2.63E-07	1.79E-06
576	2.01E-06	1.01E-05	3.22E-05	6.74E-05		780	2.77E-07	2.77E-07	2.95E-07	1.57E-06
580	5.27E-06	1.07E-05	6.36E-05	7.18E-05						

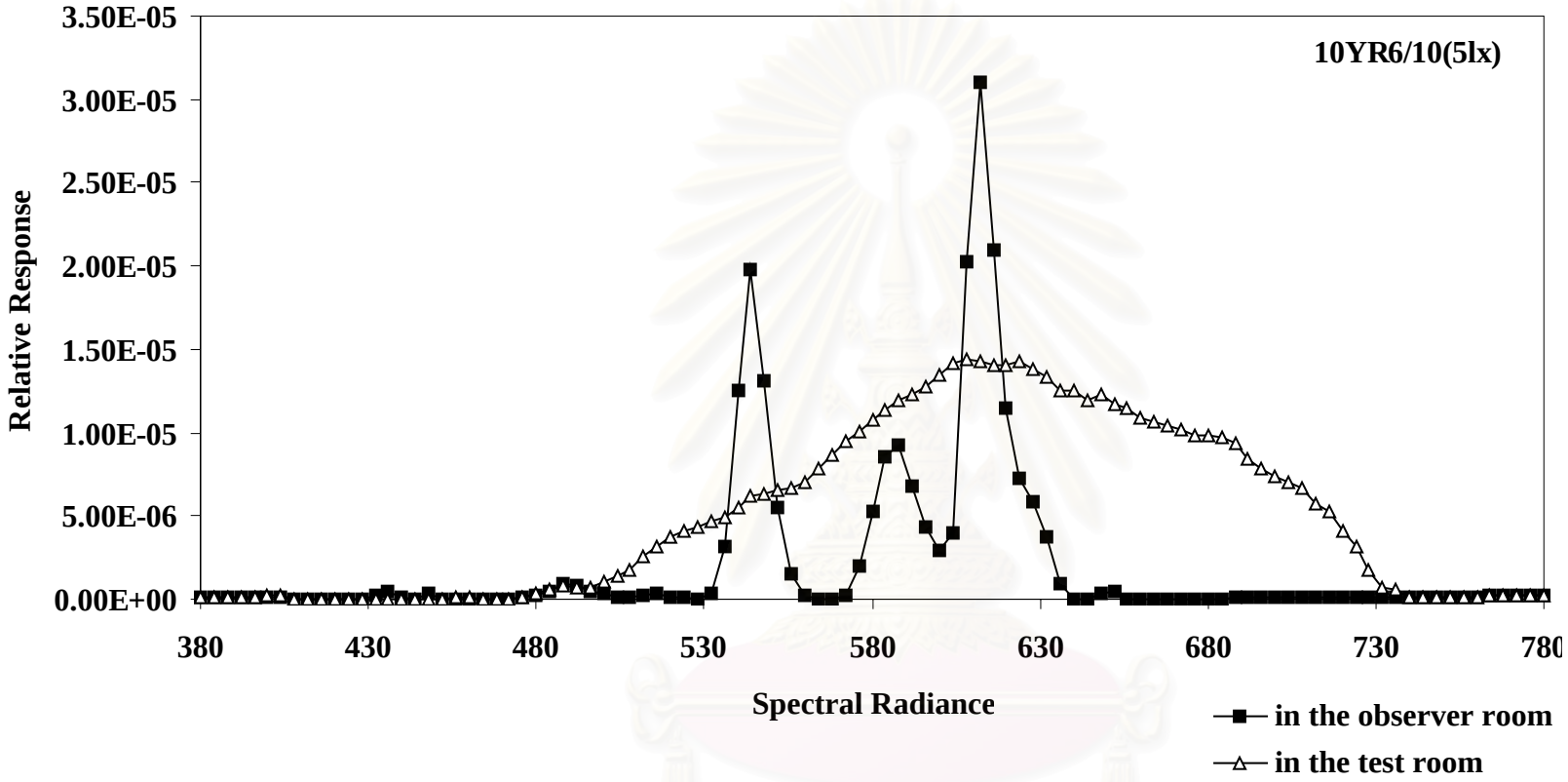


Fig.F-4a Compairison between the spatral of the color chart 10YR6/10 measured at the border of RVSI
in the test room and at 5 lux in the observer room

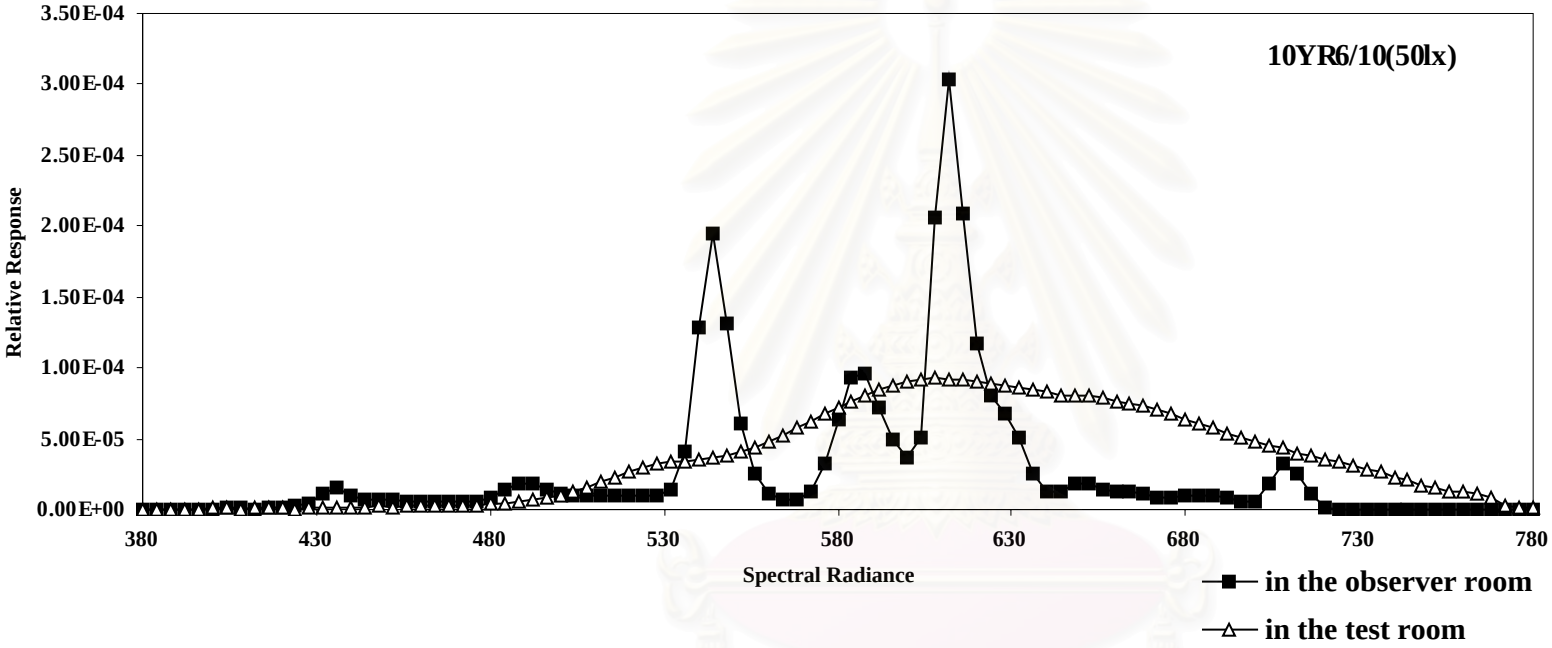


Fig.F-4b Compairison between the spatral of the color chart 10YR6/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-5 The spectral distribution data of 5Y7/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.11E-07	1.76E-07	2.43E-07		584	1.06E-05	9.50E-06	1.14E-04	8.05E-05
384	1.09E-07	1.41E-07	1.44E-07	3.40E-07		588	1.08E-05	9.98E-06	1.13E-04	8.17E-05
388	9.16E-08	9.16E-08	1.21E-07	1.40E-07		592	7.97E-06	1.02E-05	8.41E-05	8.30E-05
392	7.96E-08	7.96E-08	1.05E-07	8.45E-08		596	4.97E-06	1.03E-05	5.61E-05	8.44E-05
396	7.47E-08	1.69E-07	9.88E-08	2.71E-07		600	3.15E-06	1.05E-05	4.06E-05	8.54E-05
400	6.86E-08	4.04E-07	9.38E-07	1.07E-06		604	4.57E-06	1.08E-05	5.56E-05	8.66E-05
404	6.21E-08	6.21E-08	2.84E-06	1.35E-06		608	2.16E-05	1.10E-05	2.25E-04	8.68E-05
408	5.81E-08	5.81E-08	1.87E-06	1.12E-06		612	3.32E-05	1.08E-05	3.32E-04	8.57E-05
412	5.67E-08	5.67E-08	8.74E-07	1.59E-06		616	2.29E-05	1.06E-05	2.27E-04	8.49E-05
416	5.58E-08	5.58E-08	1.10E-06	1.33E-06		620	1.23E-05	1.05E-05	1.27E-04	8.40E-05
420	5.33E-08	5.33E-08	2.14E-06	1.46E-06		624	7.96E-06	1.04E-05	8.77E-05	8.24E-05
424	5.01E-08	5.01E-08	3.27E-06	1.50E-06		628	6.28E-06	1.02E-05	7.38E-05	8.09E-05
428	4.80E-08	4.80E-08	6.10E-06	2.31E-06		632	4.52E-06	9.75E-06	5.52E-05	7.88E-05
432	7.01E-07	8.65E-08	1.57E-05	1.97E-06		636	1.45E-06	9.33E-06	2.71E-05	7.71E-05
436	1.46E-06	2.14E-07	1.97E-05	1.63E-06		640	1.09E-07	9.01E-06	1.41E-05	7.59E-05
440	6.48E-07	1.17E-07	1.32E-05	2.13E-06		644	1.20E-07	8.65E-06	1.41E-05	7.47E-05
444	4.84E-07	4.38E-08	9.16E-06	2.57E-06		648	4.38E-07	9.09E-06	1.99E-05	7.40E-05
448	1.51E-07	6.71E-08	7.86E-06	2.49E-06		652	2.64E-07	8.72E-06	2.05E-05	7.34E-05
452	1.38E-07	3.00E-07	8.24E-06	2.49E-06		656	9.71E-08	8.18E-06	1.48E-05	7.21E-05
456	1.78E-07	4.04E-08	8.21E-06	2.60E-06		660	4.79E-08	8.44E-06	1.42E-05	7.02E-05
460	2.70E-07	4.02E-08	8.35E-06	3.09E-06		664	4.96E-08	8.31E-06	1.53E-05	6.81E-05
464	5.53E-08	3.98E-08	7.83E-06	3.50E-06		668	5.11E-08	7.89E-06	1.27E-05	6.62E-05
468	3.91E-08	3.91E-08	7.14E-06	3.47E-06		672	5.25E-08	8.03E-06	1.02E-05	6.40E-05
472	2.72E-07	3.82E-08	7.01E-06	3.97E-06		676	5.40E-08	7.30E-06	8.86E-06	6.06E-05
476	1.49E-07	4.30E-08	7.43E-06	4.07E-06		680	5.56E-08	7.29E-06	9.18E-06	5.83E-05
480	2.99E-07	6.21E-08	1.08E-05	4.49E-06		684	5.73E-08	6.84E-06	9.88E-06	5.63E-05
484	9.00E-07	9.91E-08	1.75E-05	5.00E-06		688	5.92E-08	6.44E-06	1.08E-05	5.31E-05
488	1.40E-06	2.83E-07	2.19E-05	6.07E-06		692	6.12E-08	5.66E-06	9.98E-06	5.04E-05
492	1.31E-06	7.72E-07	2.15E-05	7.17E-06		696	6.40E-08	4.82E-06	6.03E-06	4.73E-05
496	8.73E-07	5.92E-07	1.86E-05	8.70E-06		700	6.74E-08	4.79E-06	6.32E-06	4.43E-05
500	5.32E-07	9.65E-07	1.46E-05	1.11E-05		704	7.09E-08	4.43E-06	1.98E-05	4.19E-05
504	6.28E-07	1.05E-06	1.24E-05	1.40E-05		708	4.35E-07	3.52E-06	3.50E-05	4.00E-05
508	4.22E-07	1.52E-06	1.26E-05	1.84E-05		712	8.05E-08	3.53E-06	3.02E-05	3.69E-05
512	5.14E-07	2.12E-06	1.40E-05	2.33E-05		716	8.59E-08	2.57E-06	1.21E-05	3.53E-05
516	5.88E-07	3.06E-06	1.50E-05	2.97E-05		720	9.16E-08	2.42E-06	1.99E-06	3.30E-05
520	8.74E-07	3.88E-06	1.57E-05	3.63E-05		724	9.77E-08	2.11E-06	1.29E-07	3.15E-05
524	9.06E-07	4.56E-06	1.59E-05	4.25E-05		728	1.04E-07	1.06E-06	1.38E-07	2.80E-05
528	8.23E-07	5.48E-06	1.68E-05	4.77E-05		732	1.10E-07	9.17E-07	1.46E-07	2.55E-05
532	1.56E-06	6.08E-06	2.39E-05	5.13E-05		736	1.17E-07	1.17E-07	1.55E-07	2.34E-05
536	6.60E-06	6.67E-06	7.33E-05	5.40E-05		740	1.23E-07	1.23E-07	1.63E-07	2.09E-05
540	2.34E-05	7.35E-06	2.35E-04	5.63E-05		744	1.30E-07	1.30E-07	1.72E-07	1.92E-05
544	3.64E-05	8.18E-06	3.55E-04	5.90E-05		748	1.38E-07	1.38E-07	1.82E-07	1.66E-05
548	2.49E-05	8.37E-06	2.40E-04	6.18E-05		752	1.46E-07	1.46E-07	1.93E-07	1.43E-05
552	1.12E-05	8.32E-06	1.11E-04	6.55E-05		756	1.57E-07	1.57E-07	2.08E-07	1.27E-05
556	3.92E-06	8.78E-06	4.47E-05	6.84E-05		760	1.71E-07	1.71E-07	2.26E-07	1.15E-05
560	1.04E-06	9.27E-06	1.90E-05	7.15E-05		764	1.85E-07	1.85E-07	2.44E-07	9.73E-06
564	5.18E-07	9.21E-06	1.18E-05	7.43E-05		768	2.01E-07	2.01E-07	2.65E-07	9.44E-06
568	7.64E-08	9.67E-06	1.07E-05	7.64E-05		772	2.24E-07	2.24E-07	2.96E-07	6.66E-06
572	7.50E-07	9.62E-06	1.79E-05	7.78E-05		776	2.47E-07	2.47E-07	3.27E-07	4.02E-06
576	3.31E-06	9.49E-06	4.29E-05	7.90E-05		780	2.77E-07	2.77E-07	3.66E-07	3.33E-06
580	7.04E-06	9.60E-06	8.08E-05	7.96E-05						

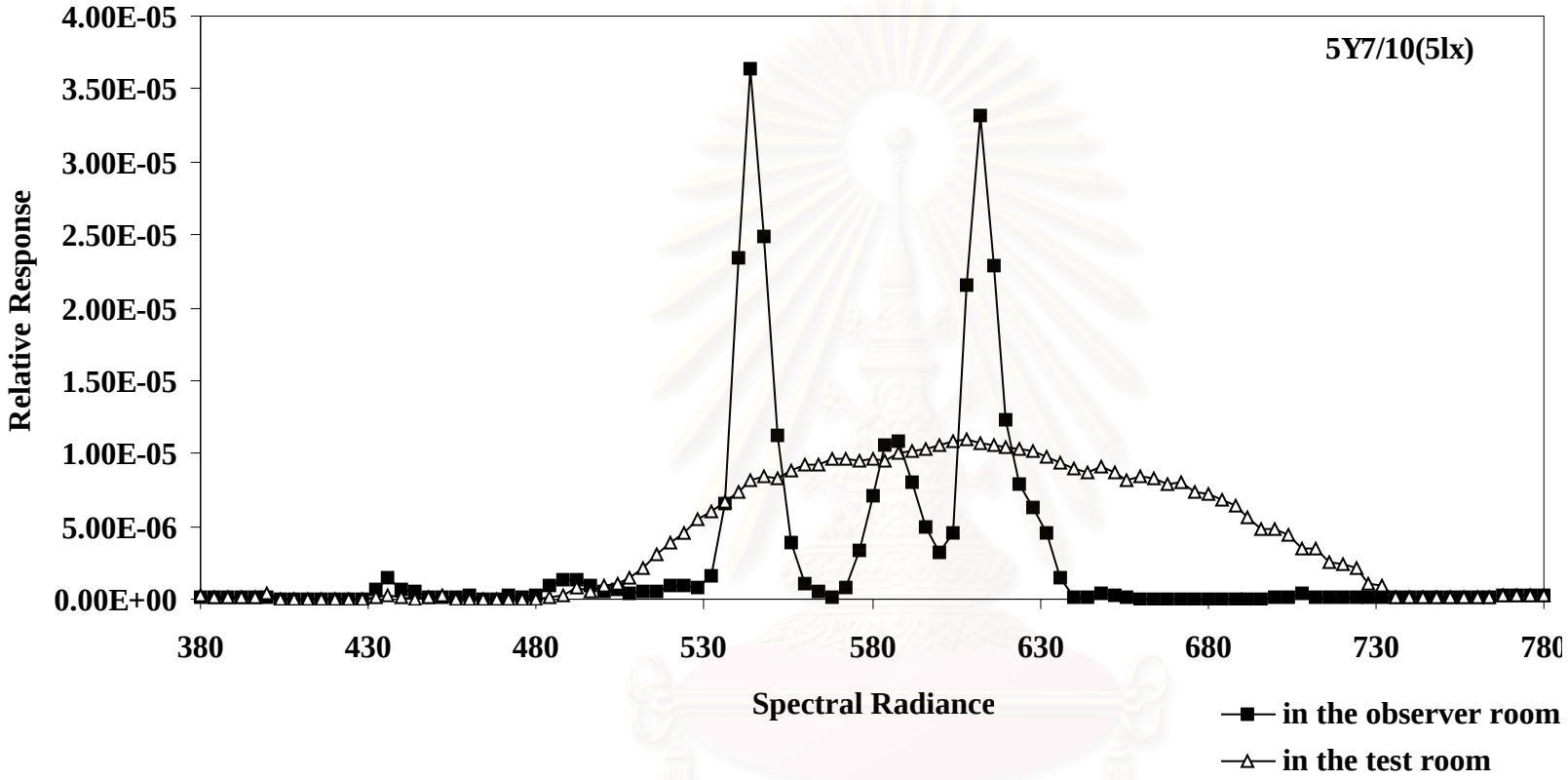


Fig.F-5a Compairison between the spatral of the color chart 5Y7/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

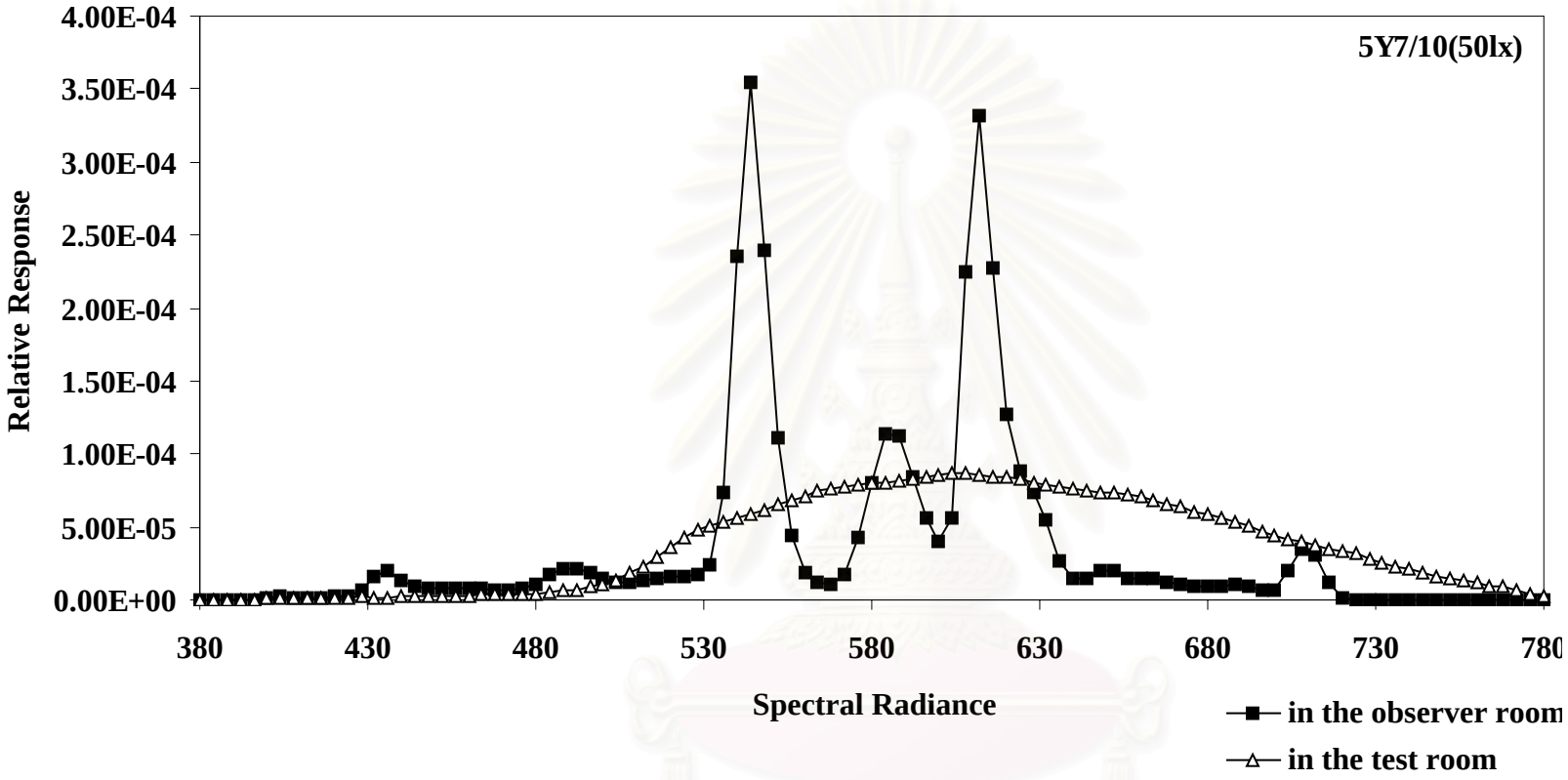


Fig.F-5b Compairison between the spatral of the color chart 5Y7/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-6 The spectral distribution data of 10Y7/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.95E-07	2.43E-07		584	1.05E-05	9.62E-06	1.12E-04	8.19E-05
384	1.09E-07	1.09E-07	1.97E-07	4.93E-07		588	1.06E-05	9.68E-06	1.10E-04	8.09E-05
388	9.16E-08	9.16E-08	5.49E-07	1.73E-07		592	7.39E-06	9.72E-06	8.08E-05	8.06E-05
392	7.96E-08	7.96E-08	1.71E-07	1.50E-07		596	4.44E-06	9.74E-06	5.31E-05	8.08E-05
396	7.47E-08	7.47E-08	6.07E-07	7.47E-08		600	2.70E-06	9.75E-06	3.76E-05	8.02E-05
400	6.86E-08	6.86E-08	3.92E-07	6.86E-08		604	3.76E-06	9.83E-06	4.89E-05	7.92E-05
404	6.21E-08	6.21E-08	6.14E-07	6.21E-08		608	1.88E-05	9.23E-06	1.94E-04	7.77E-05
408	5.81E-08	5.81E-08	6.05E-07	3.43E-07		612	2.84E-05	8.88E-06	2.85E-04	7.51E-05
412	5.67E-08	5.67E-08	3.17E-07	2.26E-07		616	1.91E-05	8.70E-06	1.94E-04	7.36E-05
416	5.58E-08	5.58E-08	6.98E-07	3.65E-07		620	1.01E-05	8.42E-06	1.07E-04	7.18E-05
420	7.13E-08	5.33E-08	9.40E-07	3.24E-07		624	5.89E-06	8.37E-06	7.28E-05	6.97E-05
424	4.34E-07	5.01E-08	2.30E-06	2.51E-07		628	4.65E-06	8.03E-06	6.11E-05	6.80E-05
428	4.07E-07	4.80E-08	4.30E-06	6.22E-07		632	3.00E-06	7.98E-06	4.53E-05	6.62E-05
432	7.40E-07	4.68E-08	1.11E-05	8.37E-07		636	6.09E-07	7.57E-06	2.20E-05	6.44E-05
436	7.11E-07	4.60E-08	1.46E-05	5.37E-07		640	4.03E-08	7.14E-06	1.10E-05	6.31E-05
440	3.13E-07	4.53E-08	9.65E-06	4.07E-07		644	4.15E-08	6.61E-06	1.19E-05	6.18E-05
444	7.67E-08	4.38E-08	6.14E-06	1.21E-06		648	5.81E-08	6.71E-06	1.61E-05	6.11E-05
448	4.20E-08	4.20E-08	6.46E-06	1.38E-06		652	1.61E-07	6.65E-06	1.63E-05	6.07E-05
452	4.09E-08	4.09E-08	6.99E-06	1.76E-06		656	9.71E-08	6.55E-06	1.19E-05	5.98E-05
456	4.04E-08	4.04E-08	6.85E-06	2.04E-06		660	4.79E-08	5.96E-06	1.10E-05	5.88E-05
460	4.02E-08	4.02E-08	7.59E-06	3.05E-06		664	4.96E-08	5.78E-06	1.19E-05	5.78E-05
464	3.98E-08	3.98E-08	8.24E-06	3.90E-06		668	5.11E-08	5.96E-06	1.00E-05	5.66E-05
468	3.91E-08	3.91E-08	8.47E-06	4.58E-06		672	5.25E-08	5.75E-06	8.77E-06	5.53E-05
472	3.82E-08	3.82E-08	9.20E-06	5.49E-06		676	5.40E-08	5.43E-06	8.27E-06	5.36E-05
476	3.71E-08	3.71E-08	1.07E-05	6.55E-06		680	5.56E-08	5.52E-06	8.35E-06	5.13E-05
480	3.64E-07	3.65E-08	1.60E-05	7.43E-06		684	5.73E-08	4.79E-06	9.76E-06	4.97E-05
484	1.59E-06	3.60E-08	2.64E-05	8.86E-06		688	5.92E-08	4.16E-06	9.43E-06	4.77E-05
488	2.58E-06	3.06E-07	3.44E-05	1.06E-05		692	6.12E-08	3.82E-06	8.06E-06	4.47E-05
492	2.43E-06	5.27E-07	3.30E-05	1.22E-05		696	6.40E-08	3.52E-06	5.03E-06	4.27E-05
496	1.60E-06	3.82E-07	2.71E-05	1.34E-05		700	6.74E-08	3.03E-06	6.06E-06	4.02E-05
500	8.87E-07	5.67E-07	1.97E-05	1.62E-05		704	7.09E-08	3.02E-06	1.70E-05	3.82E-05
504	6.34E-07	1.28E-06	1.53E-05	1.92E-05		708	7.50E-08	2.91E-06	3.05E-05	3.67E-05
508	6.31E-07	1.91E-06	1.53E-05	2.32E-05		712	8.05E-08	1.01E-06	2.60E-05	3.46E-05
512	8.72E-07	2.66E-06	1.67E-05	2.89E-05		716	8.59E-08	4.96E-07	8.48E-06	3.24E-05
516	7.60E-07	3.62E-06	1.77E-05	3.58E-05		720	9.16E-08	1.98E-07	7.20E-07	2.99E-05
520	9.34E-07	4.55E-06	1.87E-05	4.35E-05		724	9.77E-08	9.77E-08	1.36E-07	2.75E-05
524	7.47E-07	5.57E-06	1.89E-05	5.08E-05		728	1.04E-07	1.04E-07	1.46E-07	2.42E-05
528	1.18E-06	6.44E-06	1.89E-05	5.67E-05		732	1.10E-07	1.10E-07	1.54E-07	2.34E-05
532	2.09E-06	7.19E-06	2.71E-05	6.11E-05		736	1.17E-07	1.17E-07	1.63E-07	2.09E-05
536	7.57E-06	7.71E-06	8.43E-05	6.45E-05		740	1.23E-07	1.23E-07	1.72E-07	1.96E-05
540	2.65E-05	7.98E-06	2.70E-04	6.73E-05		744	1.30E-07	1.30E-07	1.82E-07	1.94E-05
544	4.11E-05	8.83E-06	4.07E-04	7.00E-05		748	1.38E-07	1.38E-07	1.92E-07	1.68E-05
548	2.78E-05	9.44E-06	2.74E-04	7.28E-05		752	1.46E-07	1.46E-07	2.04E-07	1.43E-05
552	1.23E-05	9.89E-06	1.26E-04	7.60E-05		756	1.57E-07	1.57E-07	2.20E-07	1.36E-05
556	4.34E-06	1.04E-05	5.05E-05	7.89E-05		760	1.71E-07	1.71E-07	2.38E-07	1.27E-05
560	1.39E-06	1.04E-05	2.15E-05	8.18E-05		764	1.85E-07	1.85E-07	2.58E-07	9.84E-06
564	1.29E-07	1.06E-05	1.33E-05	8.34E-05		768	2.01E-07	2.01E-07	2.80E-07	5.89E-06
568	3.34E-08	1.09E-05	1.18E-05	8.37E-05		772	2.24E-07	2.24E-07	3.12E-07	3.70E-06
572	4.49E-07	1.07E-05	1.89E-05	8.34E-05		776	2.47E-07	2.47E-07	3.45E-07	4.79E-06
576	2.67E-06	1.05E-05	4.33E-05	8.31E-05		780	2.77E-07	2.77E-07	3.86E-07	2.60E-06
580	6.76E-06	1.00E-05	8.09E-05	8.25E-05						

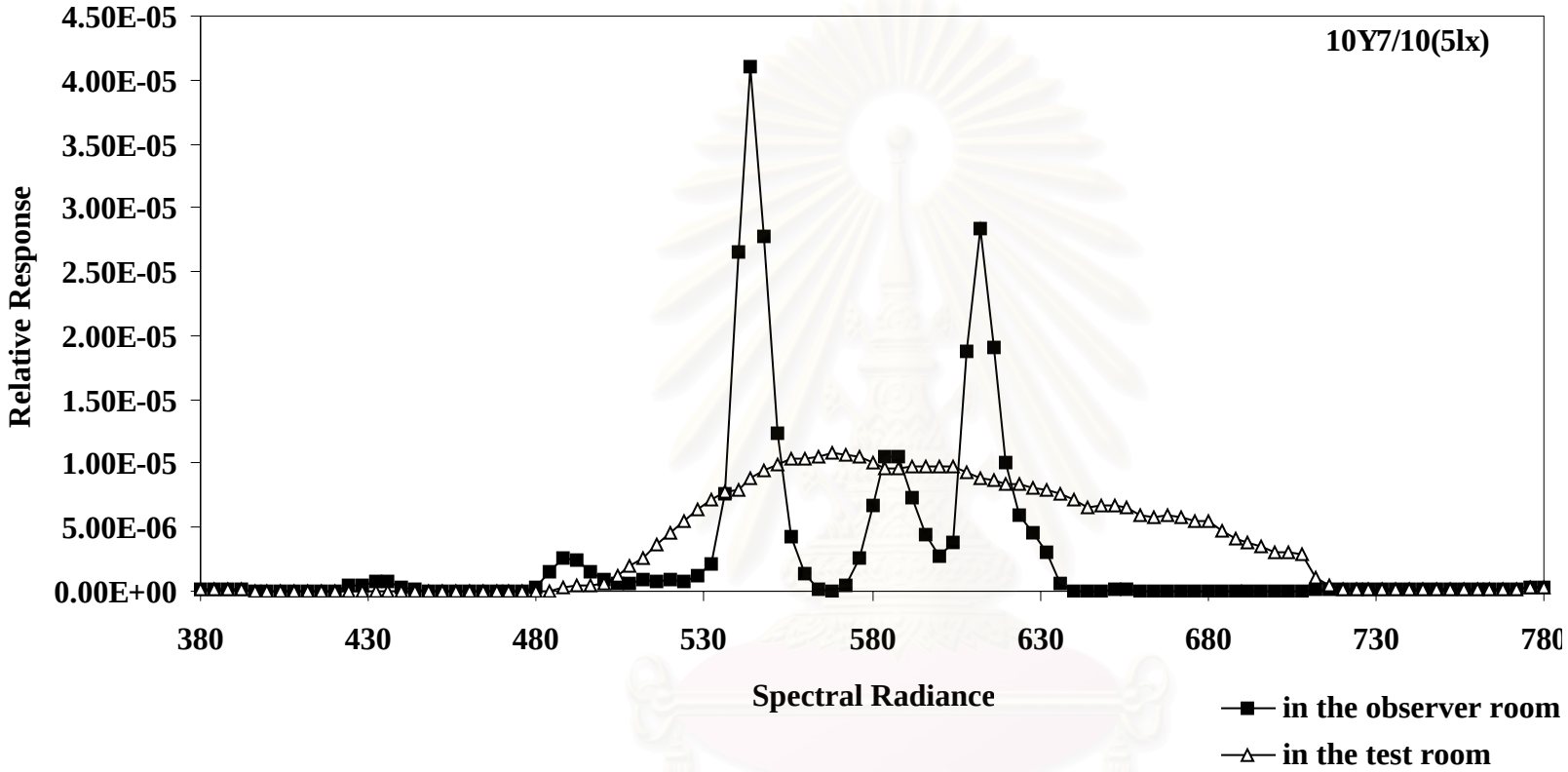


Fig.F-6a Compairison between the spatral of the color chart 10Y7/10 measured at the border of RVSI in the test room and at 5 lux in the observer room.

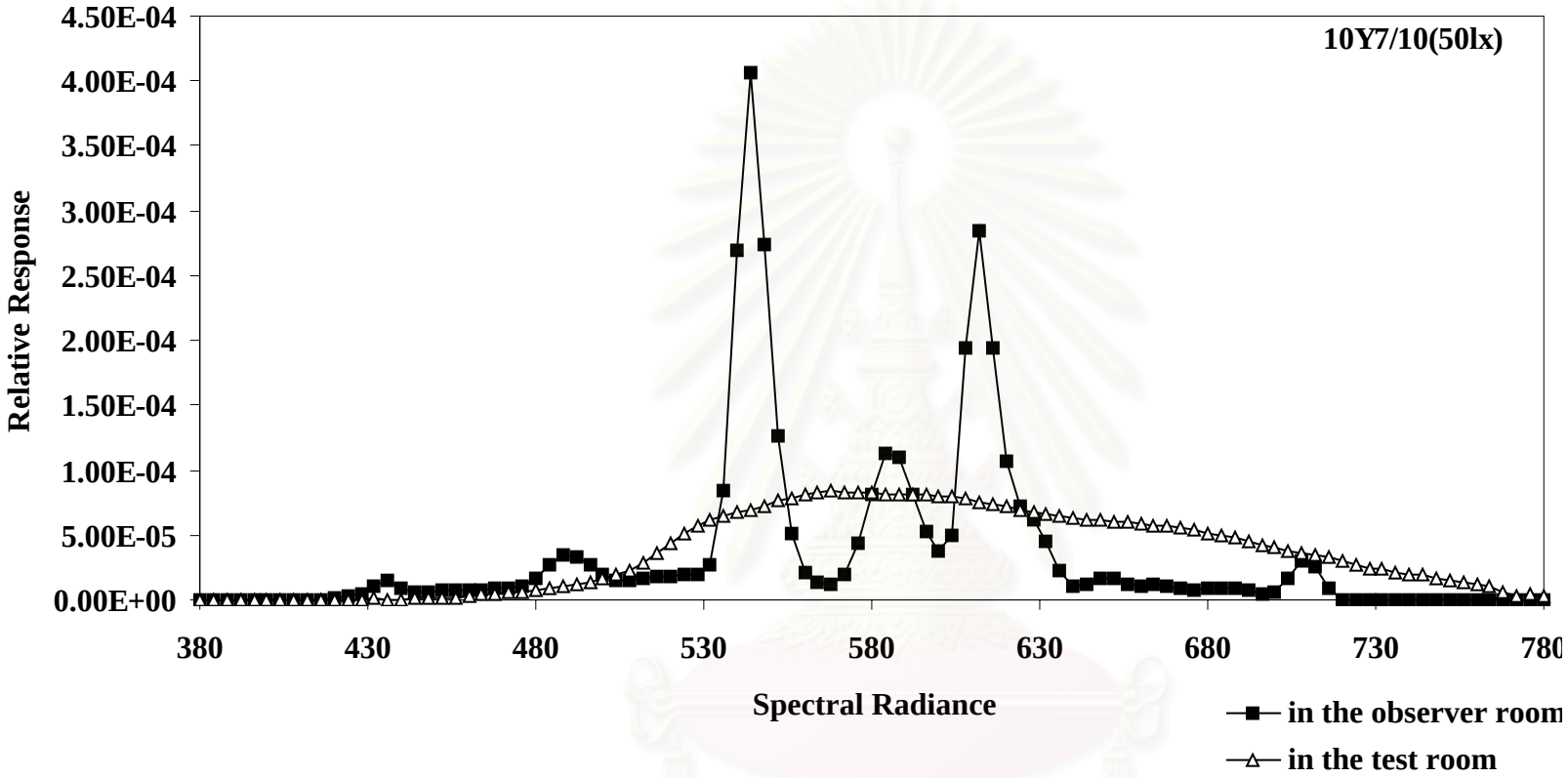


Fig.F-6b Compairison between the spatral of the color chart 10Y7/10 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-7 The spectral distribution data of 5GY6/9 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.54E-07	1.33E-07		584	6.18E-06	8.64E-06	7.04E-05	6.40E-05
384	1.09E-07	1.09E-07	1.26E-07	1.09E-07		588	6.01E-06	8.10E-06	6.71E-05	6.11E-05
388	9.16E-08	9.16E-08	1.06E-07	9.16E-08		592	3.95E-06	7.39E-06	4.80E-05	5.89E-05
392	7.96E-08	7.96E-08	9.23E-08	8.90E-07		596	1.61E-06	7.31E-06	3.03E-05	5.65E-05
396	7.47E-08	7.47E-08	8.66E-08	7.13E-07		600	5.81E-07	7.24E-06	2.02E-05	5.41E-05
400	6.86E-08	6.86E-08	2.47E-07	6.37E-07		604	1.20E-06	6.69E-06	2.55E-05	5.11E-05
404	6.21E-08	6.21E-08	7.89E-07	1.60E-07		608	8.53E-06	5.83E-06	9.81E-05	4.80E-05
408	5.81E-08	5.81E-08	5.69E-07	8.45E-08		612	1.41E-05	5.25E-06	1.43E-04	4.53E-05
412	5.67E-08	5.67E-08	1.97E-07	5.67E-08		616	9.28E-06	4.84E-06	9.63E-05	4.31E-05
416	5.58E-08	5.58E-08	8.09E-07	3.21E-07		620	4.60E-06	4.88E-06	5.16E-05	4.15E-05
420	5.33E-08	5.33E-08	4.48E-07	4.44E-07		624	3.04E-06	4.78E-06	3.40E-05	3.96E-05
424	5.01E-08	5.01E-08	1.21E-06	8.60E-07		628	2.04E-06	4.98E-06	2.82E-05	3.82E-05
428	4.80E-08	4.80E-08	3.36E-06	7.09E-07		632	1.18E-06	4.43E-06	2.10E-05	3.68E-05
432	2.45E-07	4.68E-08	9.51E-06	9.09E-07		636	1.42E-07	4.02E-06	9.89E-06	3.54E-05
436	2.52E-07	4.60E-08	1.24E-05	8.69E-07		640	4.03E-08	3.51E-06	4.17E-06	3.43E-05
440	4.53E-08	4.53E-08	8.15E-06	1.06E-06		644	4.15E-08	3.64E-06	4.75E-06	3.32E-05
444	4.38E-08	4.38E-08	5.12E-06	1.21E-06		648	4.29E-08	3.09E-06	7.16E-06	3.28E-05
448	4.20E-08	4.20E-08	5.41E-06	1.75E-06		652	4.45E-08	3.04E-06	6.71E-06	3.25E-05
452	4.09E-08	4.09E-08	6.09E-06	2.56E-06		656	4.62E-08	3.00E-06	4.41E-06	3.16E-05
456	4.04E-08	4.04E-08	6.81E-06	3.01E-06		660	4.79E-08	2.88E-06	3.54E-06	3.12E-05
460	4.02E-08	4.02E-08	7.15E-06	3.65E-06		664	4.96E-08	2.48E-06	4.30E-06	3.09E-05
464	3.98E-08	3.98E-08	7.18E-06	4.73E-06		668	5.11E-08	2.60E-06	3.73E-06	3.08E-05
468	3.91E-08	3.91E-08	7.26E-06	6.01E-06		672	5.25E-08	2.28E-06	3.21E-06	3.03E-05
472	1.40E-07	3.82E-08	8.18E-06	6.66E-06		676	5.40E-08	2.33E-06	3.44E-06	2.99E-05
476	1.84E-07	4.89E-08	9.34E-06	7.89E-06		680	5.56E-08	2.15E-06	2.59E-06	2.91E-05
480	6.60E-07	1.53E-07	1.40E-05	9.22E-06		684	5.73E-08	1.83E-06	2.84E-06	2.81E-05
484	1.74E-06	4.89E-07	2.37E-05	1.09E-05		688	5.92E-08	1.58E-06	3.39E-06	2.70E-05
488	2.57E-06	7.25E-07	3.05E-05	1.27E-05		692	6.12E-08	1.45E-06	3.14E-06	2.59E-05
492	2.69E-06	1.07E-06	2.95E-05	1.44E-05		696	6.40E-08	8.56E-07	7.78E-07	2.50E-05
496	2.02E-06	1.22E-06	2.45E-05	1.63E-05		700	6.74E-08	9.89E-07	1.23E-06	2.41E-05
500	1.07E-06	1.73E-06	1.76E-05	1.89E-05		704	7.09E-08	1.55E-06	7.08E-06	2.28E-05
504	4.71E-07	2.18E-06	1.36E-05	2.23E-05		708	7.50E-08	5.14E-07	1.39E-05	2.08E-05
508	4.33E-07	3.00E-06	1.37E-05	2.70E-05		712	8.05E-08	8.05E-08	1.23E-05	1.99E-05
512	7.21E-07	3.87E-06	1.46E-05	3.25E-05		716	8.59E-08	8.59E-08	4.38E-06	1.94E-05
516	9.41E-07	5.10E-06	1.52E-05	3.93E-05		720	9.16E-08	9.16E-08	1.06E-07	1.75E-05
520	7.38E-07	5.95E-06	1.52E-05	4.71E-05		724	9.77E-08	9.77E-08	1.13E-07	1.65E-05
524	7.46E-07	7.15E-06	1.48E-05	5.37E-05		728	1.04E-07	1.04E-07	1.21E-07	1.43E-05
528	8.80E-07	8.27E-06	1.58E-05	5.85E-05		732	1.10E-07	1.10E-07	1.28E-07	1.34E-05
532	1.47E-06	8.61E-06	2.16E-05	6.20E-05		736	1.17E-07	1.17E-07	1.36E-07	1.22E-05
536	5.97E-06	9.34E-06	6.50E-05	6.44E-05		740	1.23E-07	1.23E-07	1.43E-07	1.06E-05
540	2.10E-05	9.85E-06	2.07E-04	6.60E-05		744	1.30E-07	1.30E-07	1.51E-07	8.97E-06
544	3.21E-05	1.03E-05	3.09E-04	6.72E-05		748	1.38E-07	1.38E-07	1.59E-07	9.66E-06
548	2.14E-05	1.08E-05	2.06E-04	6.88E-05		752	1.46E-07	1.46E-07	1.70E-07	6.98E-06
552	9.18E-06	1.11E-05	9.42E-05	7.12E-05		756	1.57E-07	1.57E-07	1.83E-07	6.66E-06
556	2.87E-06	1.10E-05	3.69E-05	7.28E-05		760	1.71E-07	1.71E-07	1.98E-07	4.52E-06
560	3.88E-07	1.09E-05	1.50E-05	7.38E-05		764	1.85E-07	1.85E-07	2.14E-07	4.30E-06
564	3.67E-08	1.09E-05	8.84E-06	7.39E-05		768	2.01E-07	2.01E-07	2.33E-07	4.57E-06
568	3.34E-08	1.08E-05	7.57E-06	7.28E-05		772	2.24E-07	2.24E-07	2.59E-07	2.85E-06
572	1.34E-07	1.04E-05	1.19E-05	7.11E-05		776	2.47E-07	2.47E-07	2.86E-07	2.47E-07
576	1.53E-06	9.92E-06	2.82E-05	6.89E-05		780	2.77E-07	2.77E-07	3.21E-07	2.77E-07
580	4.00E-06	9.29E-06	5.17E-05	6.65E-05						

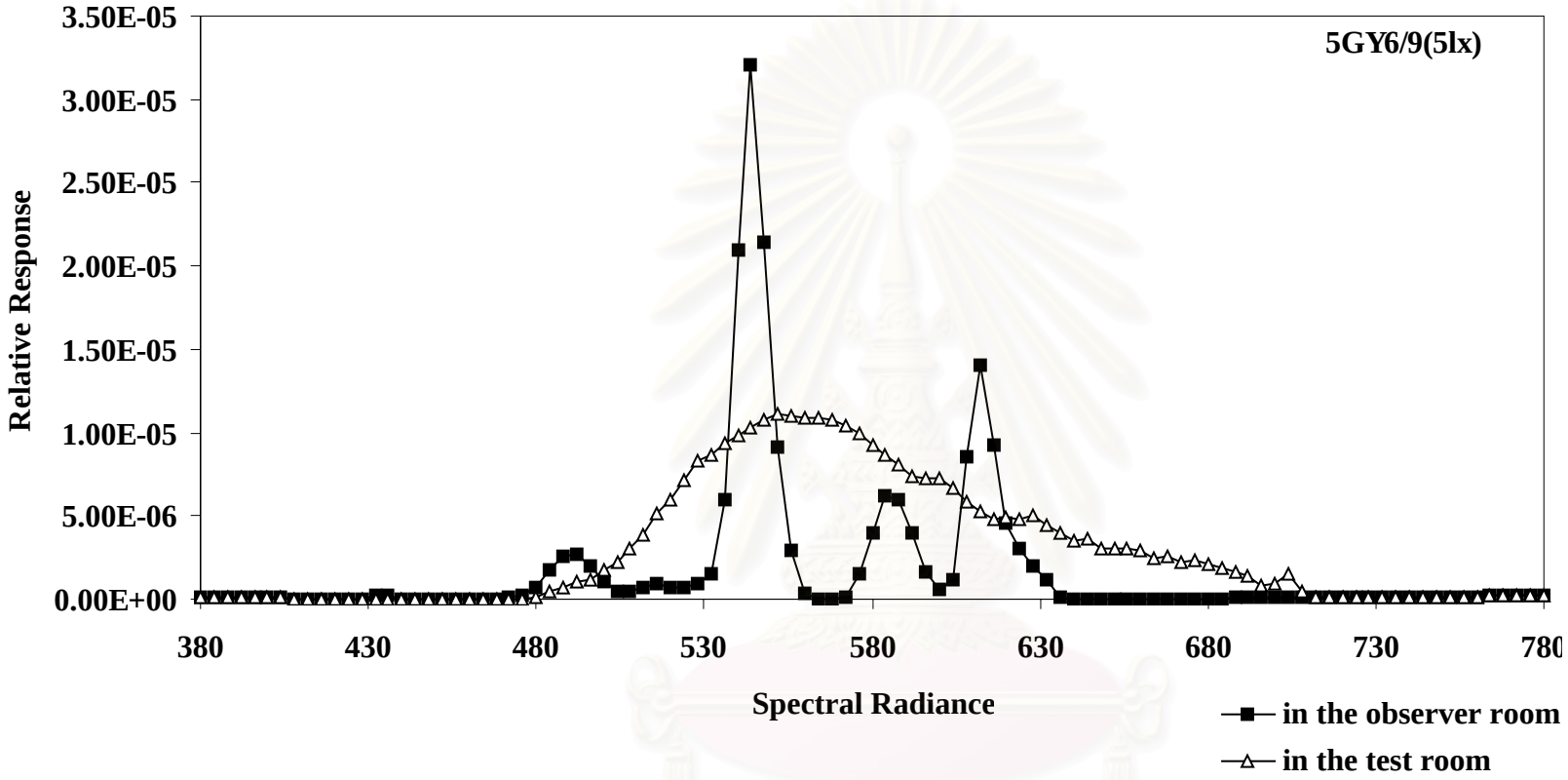


Fig.F-7a Compairison between the spatral of the color chart 5GY6/9 measured at the border of RVSI
in the test room and at 5 lux in the observer room

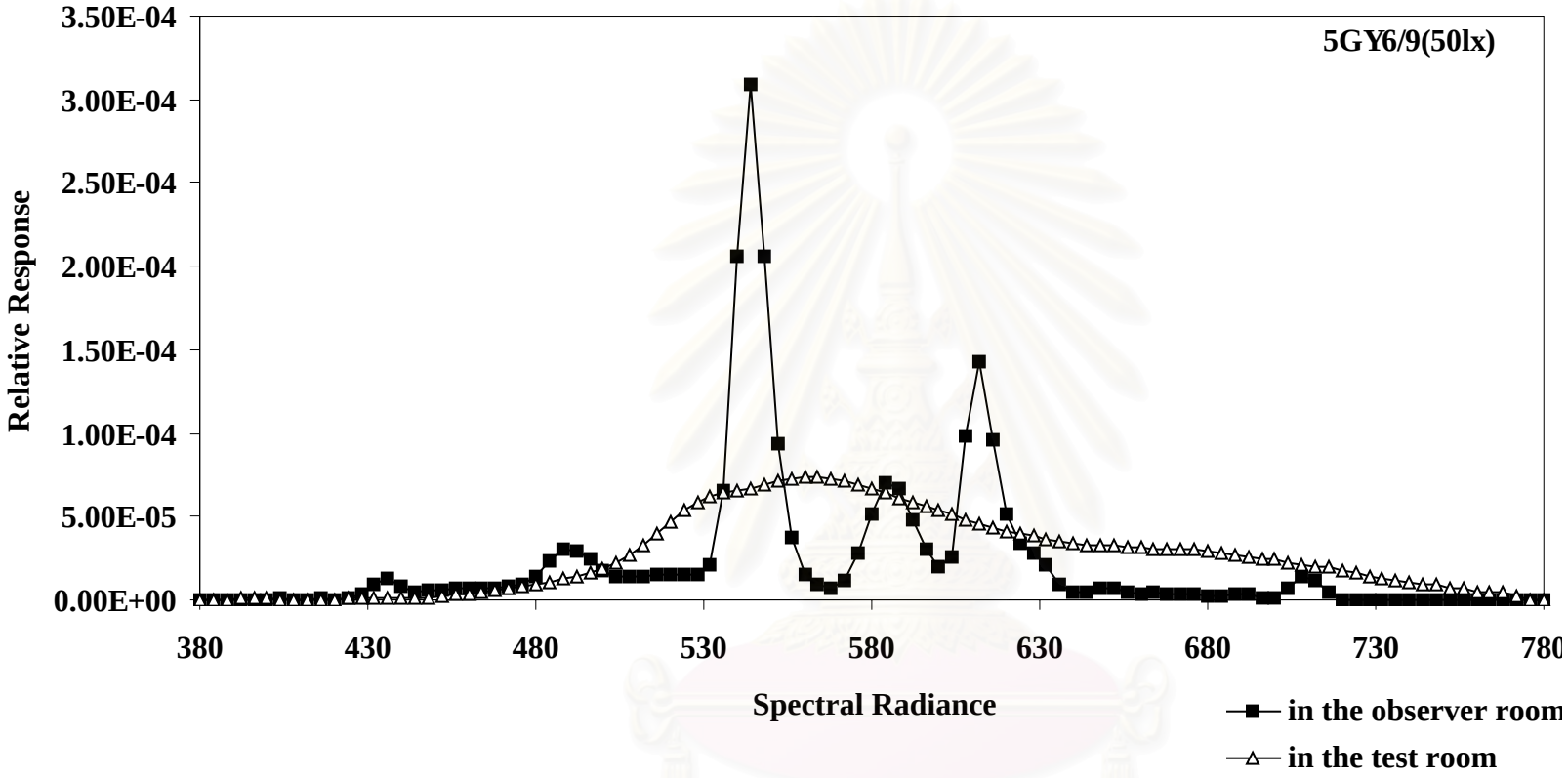


Fig.F-7b Compairison between the spatral of the color chart 5GY6/9 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-8 The spectral distribution data of 10GY6/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	6.66E-07	5.24E-07		584	4.10E-06	6.16E-06	5.40E-05	4.46E-05
384	1.09E-07	1.09E-07	5.38E-07	2.70E-07		588	3.95E-06	5.50E-06	4.97E-05	4.07E-05
388	9.16E-08	9.16E-08	1.02E-06	9.16E-08		592	2.54E-06	4.86E-06	3.48E-05	3.76E-05
392	7.96E-08	7.96E-08	6.62E-07	1.09E-07		596	7.91E-07	4.31E-06	2.09E-05	3.44E-05
396	7.47E-08	7.47E-08	8.73E-07	5.10E-07		600	1.19E-07	3.99E-06	1.34E-05	3.13E-05
400	6.86E-08	6.86E-08	1.14E-06	8.25E-07		604	3.47E-07	3.64E-06	1.57E-05	2.86E-05
404	6.21E-08	6.21E-08	3.04E-06	1.30E-06		608	4.85E-06	2.88E-06	6.02E-05	2.60E-05
408	5.81E-08	5.81E-08	1.66E-06	8.77E-07		612	7.87E-06	2.00E-06	8.74E-05	2.36E-05
412	5.67E-08	5.67E-08	6.24E-07	1.29E-06		616	4.87E-06	1.62E-06	5.83E-05	2.17E-05
416	5.58E-08	5.58E-08	7.78E-07	1.94E-06		620	1.78E-06	1.28E-06	3.07E-05	2.07E-05
420	5.33E-08	5.33E-08	2.13E-06	2.10E-06		624	6.11E-07	1.54E-06	2.00E-05	1.95E-05
424	5.01E-08	5.01E-08	2.81E-06	1.70E-06		628	3.54E-07	1.33E-06	1.69E-05	1.83E-05
428	2.47E-07	4.80E-08	7.34E-06	1.95E-06		632	6.01E-08	9.13E-07	1.15E-05	1.73E-05
432	8.61E-07	4.68E-08	1.86E-05	2.32E-06		636	3.94E-08	9.57E-07	5.11E-06	1.69E-05
436	8.54E-07	4.60E-08	2.36E-05	2.77E-06		640	4.03E-08	8.11E-07	2.13E-06	1.62E-05
440	6.17E-07	4.53E-08	1.61E-05	3.24E-06		644	4.15E-08	4.79E-07	1.92E-06	1.59E-05
444	2.14E-07	4.38E-08	1.15E-05	3.56E-06		648	4.29E-08	4.62E-07	3.55E-06	1.53E-05
448	1.72E-07	4.20E-08	1.09E-05	4.22E-06		652	4.45E-08	5.51E-07	3.68E-06	1.51E-05
452	2.28E-07	4.93E-08	1.17E-05	5.54E-06		656	4.62E-08	2.74E-07	2.54E-06	1.48E-05
456	2.86E-07	1.64E-07	1.20E-05	6.70E-06		660	4.79E-08	2.97E-07	1.89E-06	1.46E-05
460	4.46E-07	3.79E-07	1.23E-05	7.72E-06		664	4.96E-08	3.69E-07	2.24E-06	1.47E-05
464	3.82E-07	2.43E-07	1.32E-05	8.72E-06		668	5.11E-08	5.11E-08	2.16E-06	1.47E-05
468	5.08E-07	7.89E-07	1.43E-05	1.02E-05		672	5.25E-08	5.25E-08	1.32E-06	1.45E-05
472	5.36E-07	6.23E-07	1.50E-05	1.19E-05		676	5.40E-08	5.40E-08	7.14E-07	1.47E-05
476	6.22E-07	6.53E-07	1.63E-05	1.36E-05		680	5.56E-08	5.56E-08	1.42E-06	1.41E-05
480	1.36E-06	1.09E-06	2.28E-05	1.56E-05		684	5.73E-08	5.73E-08	1.36E-06	1.40E-05
484	2.93E-06	1.66E-06	3.73E-05	1.74E-05		688	5.92E-08	5.92E-08	1.39E-06	1.35E-05
488	4.01E-06	2.41E-06	4.81E-05	1.95E-05		692	6.12E-08	6.12E-08	1.18E-06	1.25E-05
492	4.18E-06	2.72E-06	4.62E-05	2.22E-05		696	6.40E-08	6.40E-08	3.26E-07	1.22E-05
496	3.21E-06	2.93E-06	3.79E-05	2.51E-05		700	6.74E-08	6.74E-08	5.52E-07	1.25E-05
500	2.36E-06	3.61E-06	2.78E-05	2.88E-05		704	7.09E-08	7.09E-08	3.74E-06	1.16E-05
504	1.35E-06	4.34E-06	2.18E-05	3.27E-05		708	7.50E-08	7.50E-08	8.04E-06	1.08E-05
508	1.05E-06	5.08E-06	2.02E-05	3.77E-05		712	8.05E-08	8.05E-08	6.28E-06	9.61E-06
512	1.26E-06	6.27E-06	2.07E-05	4.39E-05		716	8.59E-08	8.59E-08	1.91E-06	8.85E-06
516	1.22E-06	7.06E-06	2.09E-05	5.12E-05		720	9.16E-08	9.16E-08	1.16E-07	7.28E-06
520	1.09E-06	8.25E-06	2.01E-05	5.86E-05		724	9.77E-08	9.77E-08	1.24E-07	5.42E-06
524	1.10E-06	9.88E-06	1.94E-05	6.46E-05		728	1.04E-07	1.04E-07	1.32E-07	5.40E-06
528	7.41E-07	1.05E-05	1.98E-05	6.79E-05		732	1.10E-07	1.10E-07	1.40E-07	4.66E-06
532	1.22E-06	1.07E-05	2.60E-05	6.95E-05		736	1.17E-07	1.17E-07	1.49E-07	2.87E-06
536	6.59E-06	1.08E-05	7.40E-05	7.01E-05		740	1.23E-07	1.23E-07	1.56E-07	3.48E-06
540	2.31E-05	1.10E-05	2.31E-04	7.03E-05		744	1.30E-07	1.30E-07	1.66E-07	3.09E-06
544	3.50E-05	1.11E-05	3.42E-04	6.93E-05		748	1.38E-07	1.38E-07	1.75E-07	2.63E-06
548	2.31E-05	1.14E-05	2.24E-04	6.87E-05		752	1.46E-07	1.46E-07	1.86E-07	1.68E-06
552	9.72E-06	1.12E-05	9.94E-05	6.84E-05		756	1.57E-07	1.57E-07	2.00E-07	2.30E-06
556	2.86E-06	1.07E-05	3.81E-05	6.75E-05		760	1.71E-07	1.71E-07	2.17E-07	5.71E-07
560	3.29E-07	1.07E-05	1.50E-05	6.57E-05		764	1.85E-07	1.85E-07	2.35E-07	4.28E-07
564	3.31E-08	1.03E-05	8.72E-06	6.30E-05		768	2.01E-07	2.01E-07	2.55E-07	2.01E-07
568	3.34E-08	9.68E-06	7.11E-06	5.98E-05		772	2.24E-07	2.24E-07	2.84E-07	2.24E-07
572	1.09E-07	8.96E-06	1.04E-05	5.64E-05		776	2.47E-07	2.47E-07	3.14E-07	2.47E-07
576	1.15E-06	8.05E-06	2.28E-05	5.29E-05		780	2.77E-07	2.77E-07	3.52E-07	2.77E-07
580	3.18E-06	7.30E-06	4.09E-05	4.88E-05						

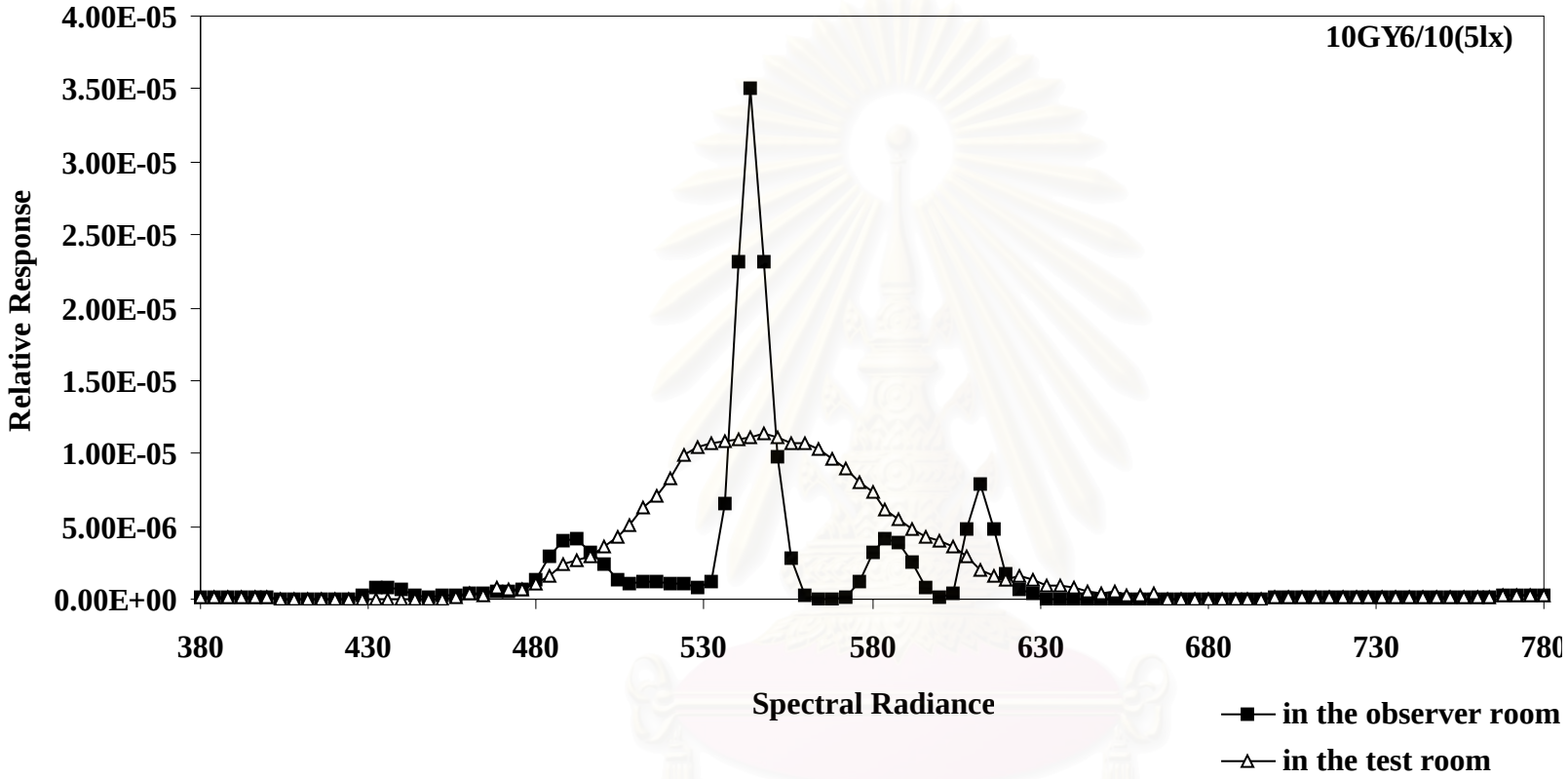


Fig.F-8a Compairison between the spatral of the color chart 10GY6/10 measured at the border of RVSI in the test room and at 5 lux in the observer room.

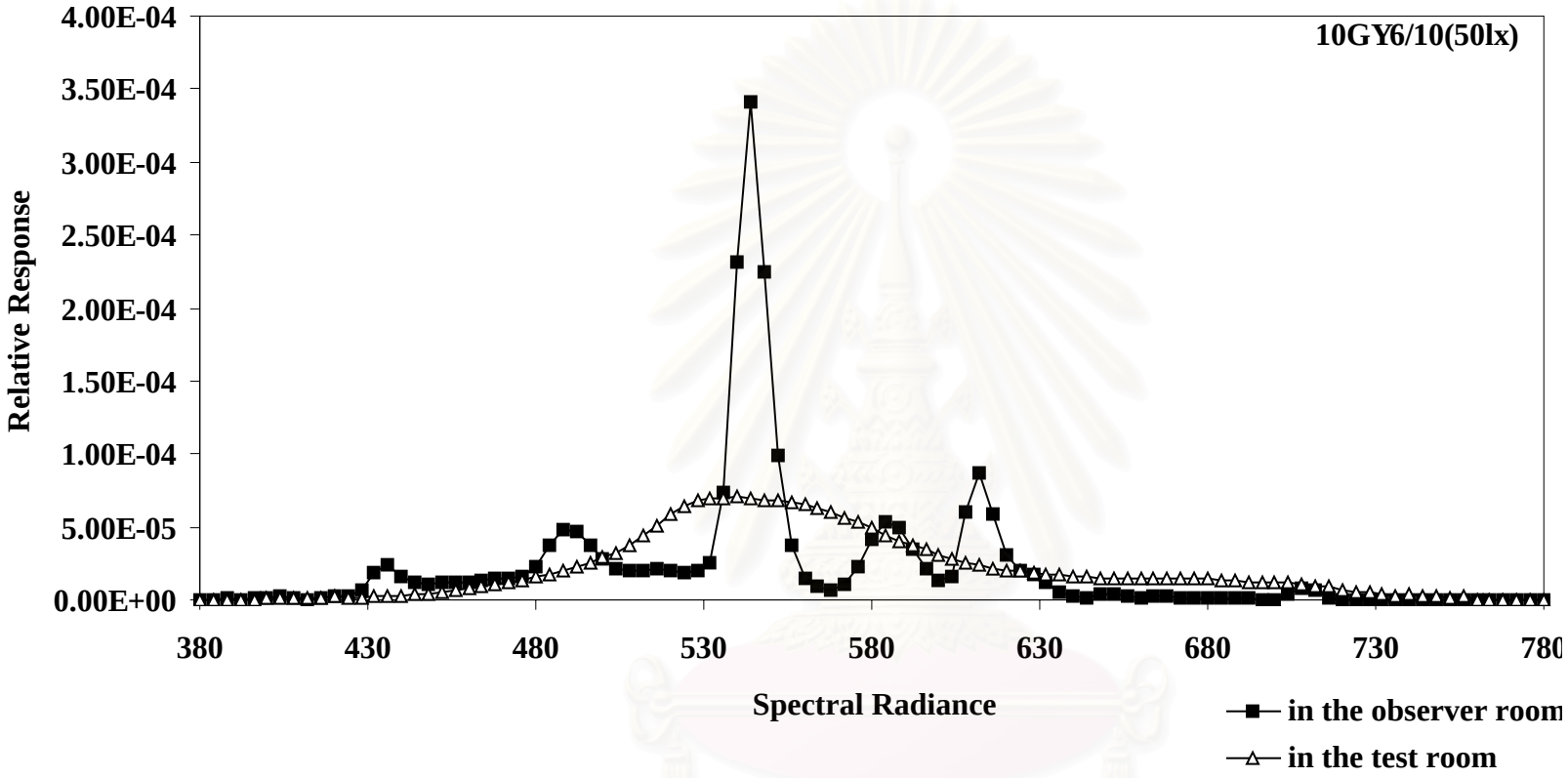


Fig.F-8b Compairison between the spatral of the color chart 10GY6/10 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-9 The spectral distribution data of 5G5/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	2.89E-07		584	1.58E-06	3.32E-06	2.66E-05	2.81E-05
384	1.09E-07	1.09E-07	1.09E-07	1.73E-07		588	1.42E-06	2.47E-06	2.43E-05	2.42E-05
388	9.16E-08	9.16E-08	9.16E-08	1.07E-06		592	6.14E-07	2.15E-06	1.63E-05	2.13E-05
392	7.96E-08	7.96E-08	7.96E-08	6.24E-07		596	1.60E-07	1.81E-06	9.36E-06	1.88E-05
396	7.47E-08	7.47E-08	8.82E-08	1.28E-06		600	3.48E-08	1.43E-06	5.92E-06	1.67E-05
400	6.86E-08	6.86E-08	7.58E-07	2.29E-06		604	8.76E-08	9.27E-07	6.86E-06	1.48E-05
404	6.21E-08	6.21E-08	2.17E-06	2.48E-06		608	1.60E-06	3.49E-07	2.75E-05	1.28E-05
408	5.81E-08	5.81E-08	1.54E-06	2.38E-06		612	2.86E-06	1.24E-07	3.99E-05	1.09E-05
412	5.67E-08	5.67E-08	1.21E-06	2.13E-06		616	1.45E-06	1.34E-07	2.63E-05	9.86E-06
416	5.58E-08	5.58E-08	1.47E-06	3.16E-06		620	3.33E-07	3.75E-08	1.34E-05	9.44E-06
420	5.33E-08	5.33E-08	2.80E-06	3.59E-06		624	4.70E-08	3.78E-08	8.67E-06	8.77E-06
424	5.01E-08	5.01E-08	3.95E-06	3.52E-06		628	3.82E-08	3.82E-08	7.06E-06	7.90E-06
428	2.18E-07	4.80E-08	8.40E-06	4.65E-06		632	3.88E-08	3.88E-08	4.56E-06	7.54E-06
432	1.28E-06	4.68E-08	2.29E-05	5.45E-06		636	3.94E-08	3.94E-08	1.42E-06	7.17E-06
436	2.08E-06	4.60E-08	2.96E-05	5.85E-06		640	4.03E-08	4.03E-08	2.13E-07	7.08E-06
440	1.04E-06	4.53E-08	2.02E-05	6.60E-06		644	4.15E-08	4.15E-08	1.71E-07	5.80E-06
444	4.27E-07	4.38E-08	1.41E-05	7.77E-06		648	4.29E-08	4.29E-08	1.01E-06	5.99E-06
448	7.12E-07	2.70E-07	1.30E-05	8.49E-06		652	4.45E-08	4.45E-08	1.04E-06	5.93E-06
452	4.58E-07	3.67E-07	1.37E-05	9.91E-06		656	4.62E-08	4.62E-08	2.37E-07	5.67E-06
456	4.16E-07	1.10E-06	1.50E-05	1.19E-05		660	4.79E-08	4.79E-08	1.19E-07	5.67E-06
460	3.96E-07	9.12E-07	1.55E-05	1.37E-05		664	4.96E-08	4.96E-08	2.98E-07	5.24E-06
464	8.82E-07	9.74E-07	1.61E-05	1.58E-05		668	5.11E-08	5.11E-08	5.11E-08	5.27E-06
468	1.01E-06	1.71E-06	1.66E-05	1.80E-05		672	5.25E-08	5.25E-08	5.25E-08	5.70E-06
472	1.02E-06	2.32E-06	1.75E-05	2.06E-05		676	5.40E-08	5.40E-08	5.40E-08	6.13E-06
476	1.07E-06	2.64E-06	1.96E-05	2.32E-05		680	5.56E-08	5.56E-08	5.56E-08	5.84E-06
480	1.91E-06	3.49E-06	2.80E-05	2.67E-05		684	5.73E-08	5.73E-08	5.73E-08	5.38E-06
484	3.98E-06	3.88E-06	4.59E-05	3.00E-05		688	5.92E-08	5.92E-08	5.92E-08	4.23E-06
488	5.52E-06	4.27E-06	5.89E-05	3.37E-05		692	6.12E-08	6.12E-08	6.12E-08	3.64E-06
492	5.50E-06	5.24E-06	5.62E-05	3.77E-05		696	6.40E-08	6.40E-08	6.40E-08	3.12E-06
496	4.05E-06	5.63E-06	4.53E-05	4.19E-05		700	6.74E-08	6.74E-08	6.74E-08	3.32E-06
500	2.39E-06	6.47E-06	3.17E-05	4.58E-05		704	7.09E-08	7.09E-08	8.02E-07	3.27E-06
504	1.78E-06	7.70E-06	2.40E-05	5.03E-05		708	7.50E-08	7.50E-08	2.13E-06	2.56E-06
508	1.54E-06	8.39E-06	2.13E-05	5.52E-05		712	8.05E-08	8.05E-08	1.61E-06	2.63E-06
512	1.44E-06	9.26E-06	2.04E-05	6.06E-05		716	8.59E-08	8.59E-08	8.59E-08	2.76E-06
516	1.10E-06	9.86E-06	1.92E-05	6.57E-05		720	9.16E-08	9.16E-08	9.16E-08	2.00E-06
520	9.08E-07	1.06E-05	1.77E-05	6.99E-05		724	9.77E-08	9.77E-08	9.77E-08	1.39E-06
524	5.39E-07	1.09E-05	1.56E-05	7.14E-05		728	1.04E-07	1.04E-07	1.04E-07	2.23E-06
528	3.31E-07	1.14E-05	1.46E-05	7.16E-05		732	1.10E-07	1.10E-07	1.10E-07	4.21E-07
532	5.91E-07	1.15E-05	1.84E-05	7.04E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	3.95E-06	1.10E-05	5.09E-05	6.80E-05		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	1.54E-05	1.08E-05	1.56E-04	6.50E-05		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	2.31E-05	1.02E-05	2.27E-04	6.18E-05		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	1.48E-05	9.61E-06	1.47E-04	5.90E-05		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	5.90E-06	9.19E-06	6.36E-05	5.67E-05		756	1.57E-07	1.57E-07	1.57E-07	1.57E-07
556	1.69E-06	8.82E-06	2.35E-05	5.43E-05		760	1.71E-07	1.71E-07	1.71E-07	1.71E-07
560	2.42E-07	8.28E-06	8.62E-06	5.13E-05		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	3.31E-08	7.05E-06	4.48E-06	4.77E-05		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	3.34E-08	6.00E-06	3.46E-06	4.35E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	5.25E-06	5.13E-06	3.94E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	6.90E-08	4.68E-06	1.16E-05	3.54E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	8.85E-07	3.81E-06	2.07E-05	3.16E-05						

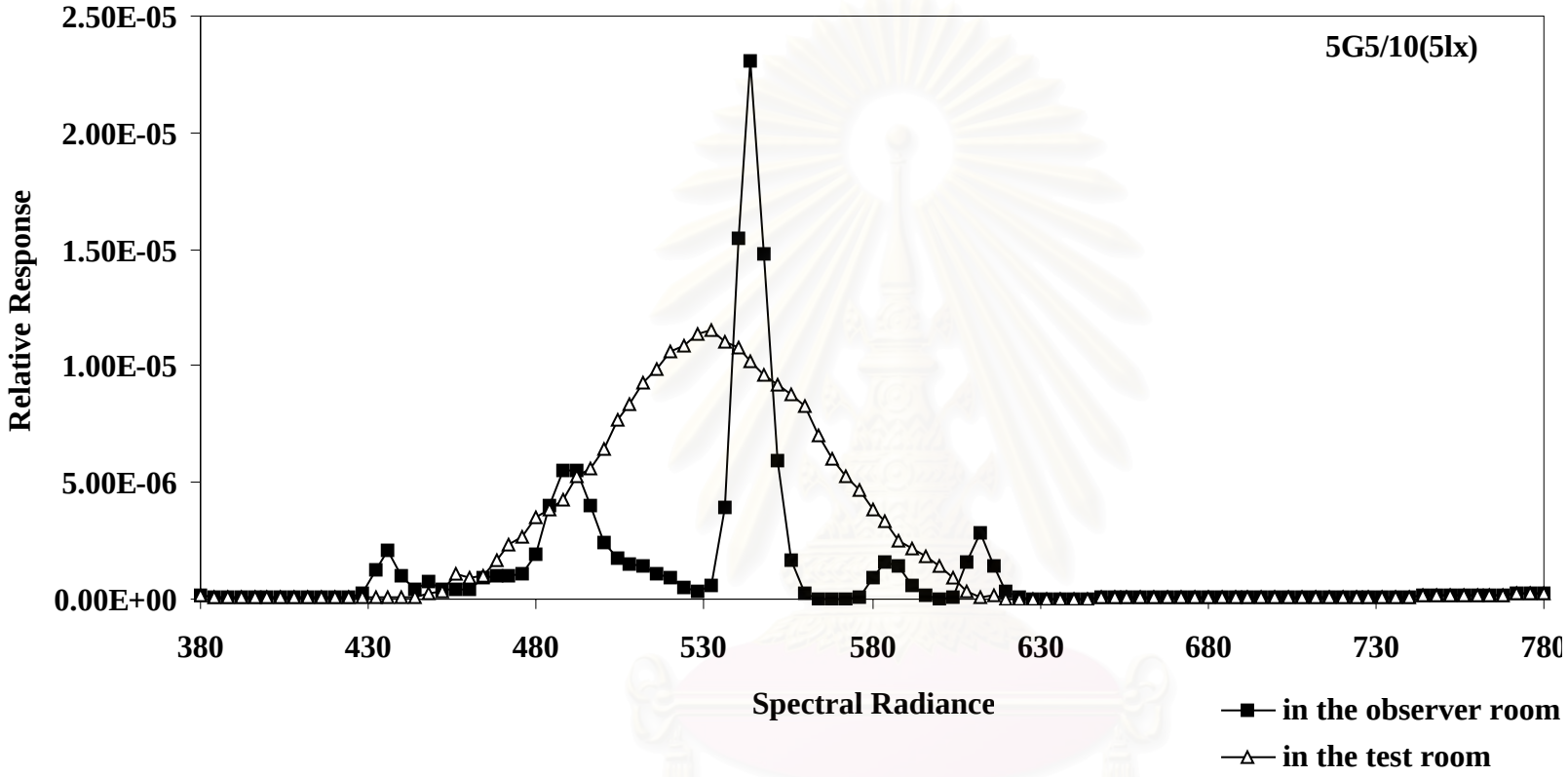


Fig.F-9a Compairison between the spatral of the color chart 5G5/10 measured at the border of RVSI
in the test room and at 5 lux in the observer room

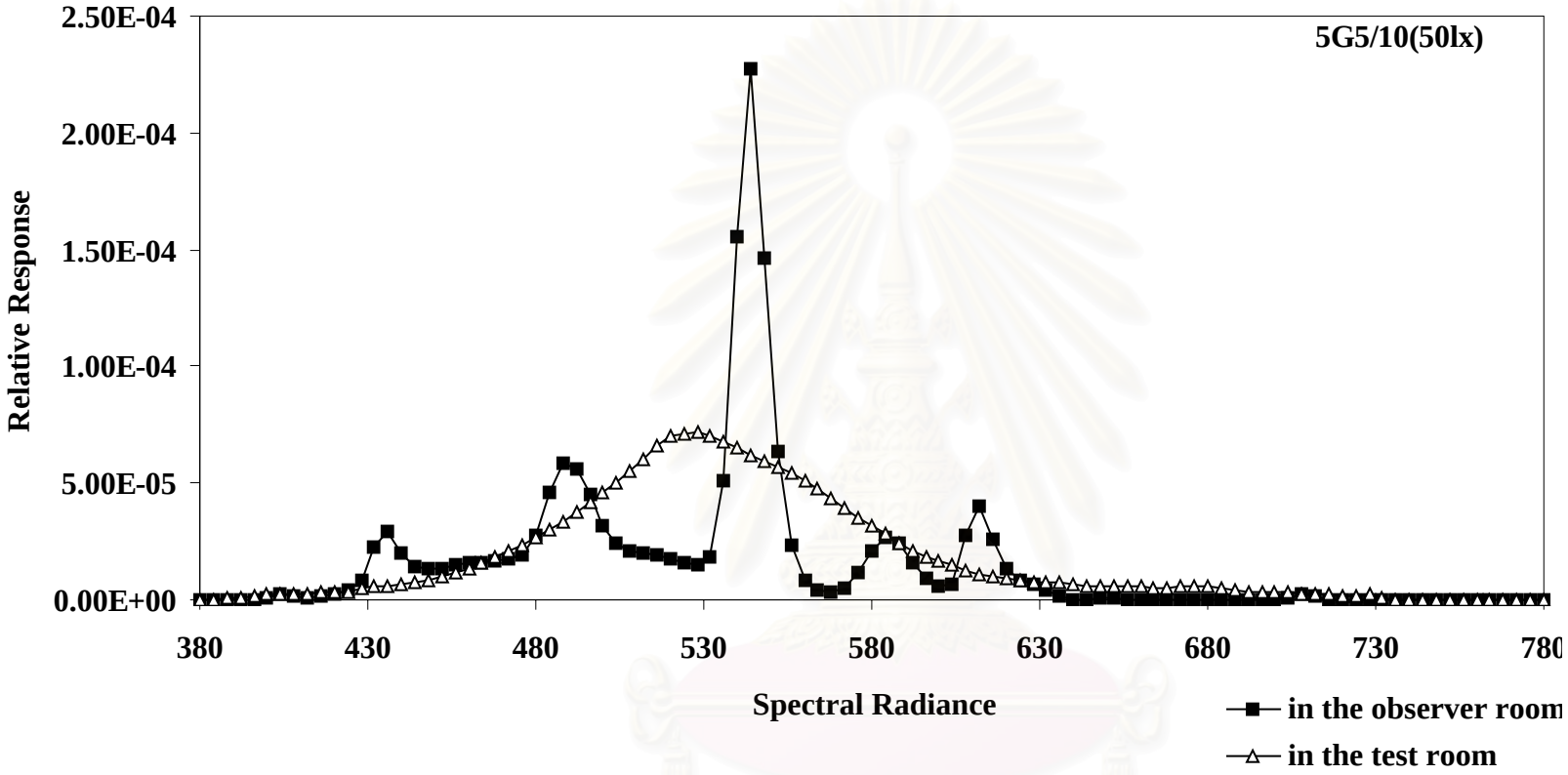


Fig.F-9b Compairison between the spatral of the color chart 5G5/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-10 The spectral distribution data of 10G5/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.43E-07	5.24E-07		584	1.10E-06	2.66E-06	2.45E-05	2.62E-05
384	1.09E-07	1.09E-07	1.09E-07	8.84E-07		588	1.18E-06	1.85E-06	2.19E-05	2.26E-05
388	9.16E-08	9.16E-08	1.67E-07	1.13E-06		592	5.16E-07	1.42E-06	1.46E-05	1.99E-05
392	7.96E-08	7.96E-08	8.43E-08	2.25E-06		596	3.40E-08	1.25E-06	8.56E-06	1.75E-05
396	7.47E-08	7.47E-08	3.04E-07	2.25E-06		600	3.48E-08	8.25E-07	4.83E-06	1.60E-05
400	6.86E-08	6.86E-08	1.90E-06	2.18E-06		604	7.37E-08	5.88E-07	5.90E-06	1.39E-05
404	6.21E-08	6.21E-08	2.92E-06	3.43E-06		608	1.19E-06	3.65E-08	2.46E-05	1.14E-05
408	2.80E-07	5.81E-08	1.96E-06	4.07E-06		612	2.19E-06	3.69E-08	3.61E-05	1.00E-05
412	1.88E-07	5.67E-08	1.40E-06	4.14E-06		616	1.11E-06	3.73E-08	2.37E-05	8.99E-06
416	5.58E-08	5.58E-08	2.05E-06	4.66E-06		620	1.73E-07	3.75E-08	1.24E-05	8.19E-06
420	5.33E-08	5.33E-08	2.94E-06	5.15E-06		624	3.78E-08	3.78E-08	8.07E-06	7.20E-06
424	5.01E-08	5.01E-08	5.02E-06	5.65E-06		628	3.82E-08	3.82E-08	6.51E-06	6.84E-06
428	3.03E-07	4.80E-08	1.15E-05	6.36E-06		632	3.88E-08	3.88E-08	4.56E-06	6.97E-06
432	1.58E-06	1.06E-07	3.02E-05	7.46E-06		636	3.94E-08	3.94E-08	1.39E-06	6.61E-06
436	2.36E-06	1.08E-07	3.87E-05	8.76E-06		640	4.03E-08	4.03E-08	1.40E-07	6.04E-06
440	1.23E-06	1.38E-07	2.64E-05	9.90E-06		644	4.15E-08	4.15E-08	7.73E-08	5.57E-06
444	6.38E-07	1.40E-07	1.87E-05	1.10E-05		648	4.29E-08	4.29E-08	4.56E-07	5.56E-06
448	9.68E-07	2.82E-07	1.85E-05	1.26E-05		652	4.45E-08	4.45E-08	7.26E-07	5.67E-06
452	8.27E-07	7.86E-07	1.91E-05	1.43E-05		656	4.62E-08	4.62E-08	2.12E-07	5.25E-06
456	1.22E-06	1.20E-06	2.00E-05	1.67E-05		660	4.79E-08	4.79E-08	4.79E-08	5.22E-06
460	1.80E-06	1.75E-06	2.12E-05	1.99E-05		664	4.96E-08	4.96E-08	4.96E-08	5.22E-06
464	1.77E-06	1.98E-06	2.16E-05	2.35E-05		668	5.11E-08	5.11E-08	5.11E-08	5.29E-06
468	1.28E-06	2.88E-06	2.28E-05	2.71E-05		672	5.25E-08	5.25E-08	5.25E-08	5.39E-06
472	1.29E-06	3.58E-06	2.43E-05	3.10E-05		676	5.40E-08	5.40E-08	5.40E-08	5.09E-06
476	1.87E-06	4.23E-06	2.66E-05	3.47E-05		680	5.56E-08	5.56E-08	5.56E-08	4.69E-06
480	3.34E-06	4.94E-06	3.79E-05	3.95E-05		684	5.73E-08	5.73E-08	5.73E-08	4.85E-06
484	5.71E-06	5.79E-06	6.25E-05	4.47E-05		688	5.92E-08	5.92E-08	5.92E-08	4.97E-06
488	7.88E-06	6.76E-06	7.96E-05	5.00E-05		692	6.12E-08	6.12E-08	6.12E-08	4.88E-06
492	7.25E-06	7.54E-06	7.51E-05	5.51E-05		696	6.40E-08	6.40E-08	6.40E-08	3.96E-06
496	5.30E-06	7.81E-06	5.96E-05	5.86E-05		700	6.74E-08	6.74E-08	6.74E-08	4.43E-06
500	3.39E-06	8.59E-06	4.07E-05	6.24E-05		704	7.09E-08	7.09E-08	3.29E-07	4.36E-06
504	2.27E-06	9.14E-06	2.95E-05	6.53E-05		708	7.50E-08	7.50E-08	1.36E-06	2.72E-06
508	1.53E-06	9.68E-06	2.46E-05	6.83E-05		712	8.05E-08	8.05E-08	3.99E-07	2.39E-06
512	1.34E-06	9.60E-06	2.27E-05	7.08E-05		716	8.59E-08	8.59E-08	8.59E-08	1.83E-06
516	1.23E-06	1.01E-05	2.06E-05	7.31E-05		720	9.16E-08	9.16E-08	9.16E-08	1.07E-06
520	9.67E-07	1.03E-05	1.79E-05	7.46E-05		724	9.77E-08	9.77E-08	9.77E-08	3.95E-07
524	7.24E-07	1.09E-05	1.50E-05	7.47E-05		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	5.71E-07	1.05E-05	1.41E-05	7.36E-05		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	8.04E-07	1.01E-05	1.76E-05	7.11E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	3.98E-06	9.97E-06	4.87E-05	6.80E-05		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	1.44E-05	9.58E-06	1.47E-04	6.49E-05		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	2.19E-05	8.81E-06	2.14E-04	6.09E-05		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	1.39E-05	8.57E-06	1.38E-04	5.84E-05		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	5.29E-06	8.20E-06	5.94E-05	5.59E-05		756	1.57E-07	1.57E-07	1.57E-07	1.57E-07
556	1.19E-06	7.60E-06	2.19E-05	5.30E-05		760	1.71E-07	1.71E-07	1.71E-07	1.71E-07
560	1.02E-07	6.97E-06	8.03E-06	5.00E-05		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	3.31E-08	6.11E-06	4.39E-06	4.59E-05		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	3.34E-08	5.03E-06	3.12E-06	4.14E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	4.71E-06	4.37E-06	3.76E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	3.31E-08	3.78E-06	1.04E-05	3.37E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	6.81E-07	3.29E-06	1.87E-05	2.98E-05						

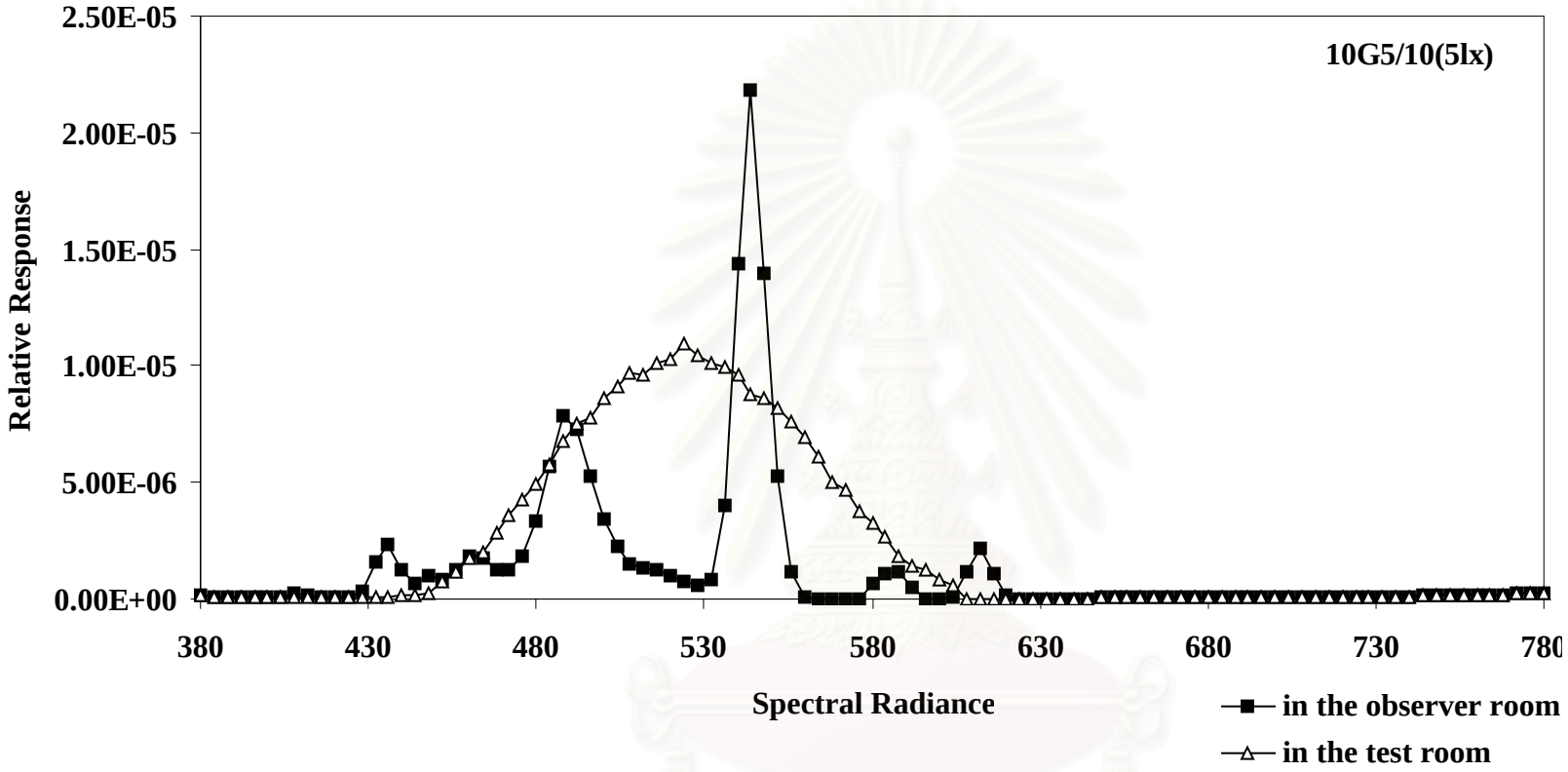


Fig.F-10a Compairison between the spatral of the color chart 10G5/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

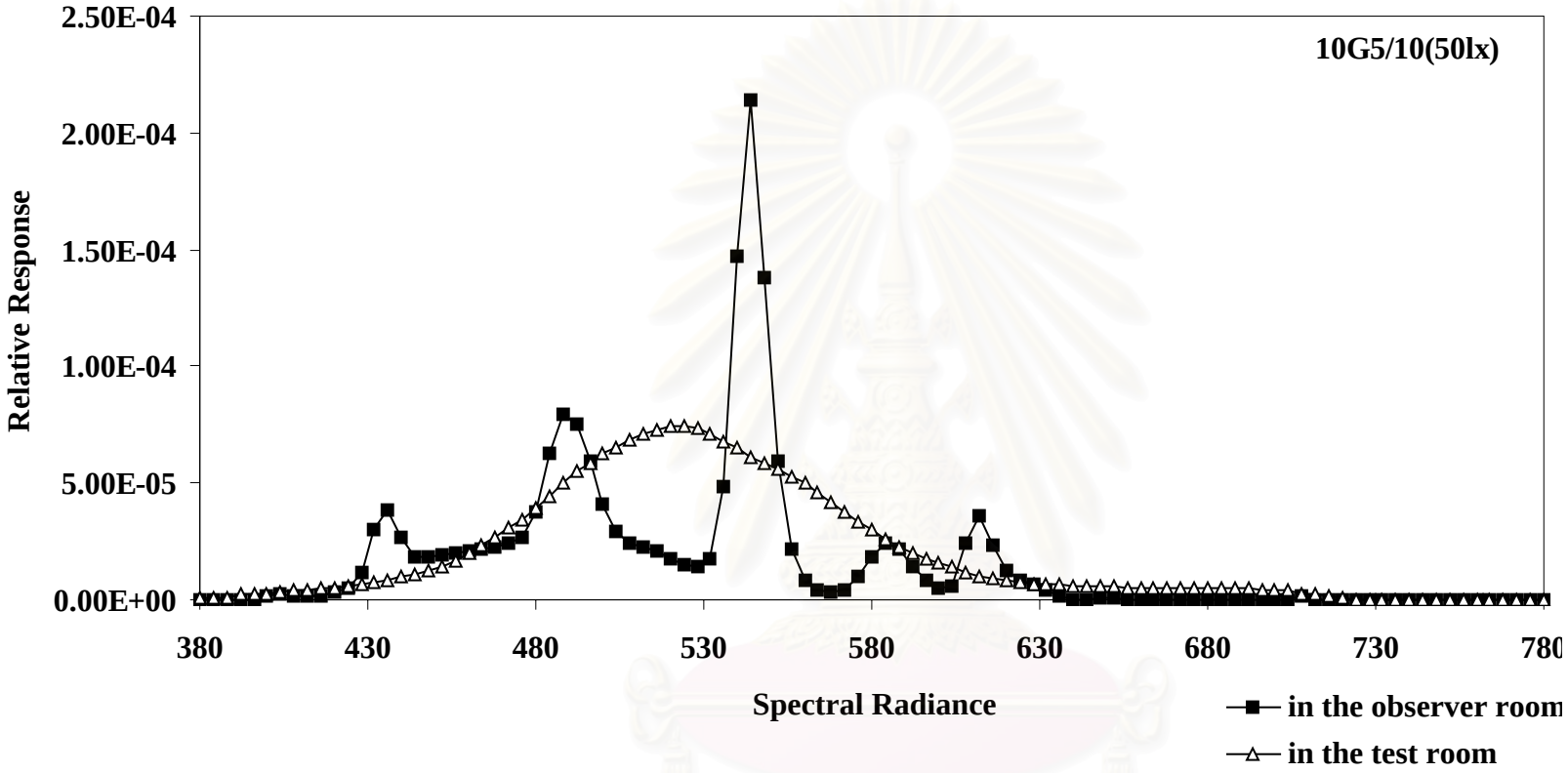


Fig.F-10b Compairison between the spatral of the color chart 10G5/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-11 The spectral distribution data of 5BG4/9 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	4.54E-07		584	1.74E-07	1.45E-06	1.29E-05	1.82E-05
384	1.09E-07	1.09E-07	1.09E-07	1.73E-07		588	8.53E-08	1.27E-06	1.23E-05	1.62E-05
388	9.16E-08	9.16E-08	9.16E-08	7.70E-07		592	3.33E-08	7.40E-07	8.44E-06	1.45E-05
392	7.96E-08	7.96E-08	7.96E-08	2.41E-06		596	3.40E-08	3.43E-07	4.90E-06	1.29E-05
396	7.47E-08	7.47E-08	2.10E-07	3.03E-06		600	3.48E-08	4.82E-07	2.86E-06	1.15E-05
400	6.86E-08	6.86E-08	1.29E-06	3.65E-06		604	3.57E-08	9.69E-08	3.72E-06	1.06E-05
404	6.21E-08	6.21E-08	2.14E-06	3.77E-06		608	2.22E-07	3.65E-08	1.68E-05	9.78E-06
408	5.81E-08	5.81E-08	2.02E-06	4.31E-06		612	7.69E-07	3.69E-08	2.54E-05	8.75E-06
412	5.67E-08	5.67E-08	1.13E-06	5.52E-06		616	2.79E-07	3.73E-08	1.65E-05	7.51E-06
416	5.58E-08	5.58E-08	1.23E-06	6.71E-06		620	3.75E-08	3.75E-08	8.35E-06	7.26E-06
420	5.33E-08	7.13E-08	2.16E-06	6.78E-06		624	3.78E-08	3.78E-08	5.15E-06	6.85E-06
424	5.01E-08	3.84E-07	4.63E-06	8.16E-06		628	3.82E-08	3.82E-08	4.12E-06	6.66E-06
428	2.75E-07	1.19E-07	1.06E-05	9.18E-06		632	3.88E-08	3.88E-08	2.19E-06	5.93E-06
432	1.49E-06	2.81E-07	2.71E-05	1.05E-05		636	3.94E-08	3.94E-08	4.63E-07	5.61E-06
436	2.44E-06	4.03E-07	3.45E-05	1.12E-05		640	4.03E-08	4.03E-08	4.03E-08	5.73E-06
440	1.89E-06	6.22E-07	2.36E-05	1.31E-05		644	4.15E-08	4.15E-08	4.15E-08	5.00E-06
444	1.40E-06	6.21E-07	1.68E-05	1.55E-05		648	4.29E-08	4.29E-08	4.29E-08	4.68E-06
448	1.03E-06	1.25E-06	1.62E-05	1.78E-05		652	4.45E-08	4.45E-08	4.45E-08	4.78E-06
452	6.99E-07	2.17E-06	1.72E-05	1.99E-05		656	4.62E-08	4.62E-08	4.62E-08	4.40E-06
456	1.34E-06	2.57E-06	1.84E-05	2.41E-05		660	4.79E-08	4.79E-08	1.74E-07	4.36E-06
460	1.32E-06	3.69E-06	1.97E-05	2.88E-05		664	4.96E-08	4.96E-08	1.21E-07	4.54E-06
464	9.55E-07	4.70E-06	2.05E-05	3.40E-05		668	5.11E-08	5.11E-08	5.11E-08	4.16E-06
468	1.08E-06	5.31E-06	2.19E-05	3.94E-05		672	5.25E-08	5.25E-08	5.25E-08	3.60E-06
472	1.25E-06	6.42E-06	2.31E-05	4.51E-05		676	5.40E-08	5.40E-08	5.40E-08	3.71E-06
476	1.81E-06	7.43E-06	2.57E-05	5.15E-05		680	5.56E-08	5.56E-08	5.56E-08	3.37E-06
480	3.26E-06	8.88E-06	3.68E-05	5.87E-05		684	5.73E-08	5.73E-08	5.73E-08	4.13E-06
484	5.64E-06	9.83E-06	6.00E-05	6.61E-05		688	5.92E-08	5.92E-08	5.92E-08	3.14E-06
488	7.46E-06	1.10E-05	7.58E-05	7.29E-05		692	6.12E-08	6.12E-08	6.12E-08	2.40E-06
492	6.54E-06	1.20E-05	7.05E-05	7.82E-05		696	6.40E-08	6.40E-08	6.40E-08	2.68E-06
496	5.04E-06	1.26E-05	5.43E-05	8.13E-05		700	6.74E-08	6.74E-08	6.74E-08	2.08E-06
500	2.85E-06	1.29E-05	3.56E-05	8.24E-05		704	7.09E-08	7.09E-08	7.09E-08	1.71E-06
504	1.82E-06	1.27E-05	2.43E-05	8.18E-05		708	7.50E-08	7.50E-08	7.54E-08	7.59E-07
508	8.69E-07	1.26E-05	1.91E-05	8.04E-05		712	8.05E-08	8.05E-08	1.44E-07	6.44E-07
512	5.75E-07	1.23E-05	1.64E-05	7.92E-05		716	8.59E-08	8.59E-08	8.59E-08	4.40E-07
516	3.00E-07	1.23E-05	1.44E-05	7.82E-05		720	9.16E-08	9.16E-08	9.16E-08	9.16E-08
520	1.96E-07	1.21E-05	1.21E-05	7.64E-05		724	9.77E-08	9.77E-08	9.77E-08	9.77E-08
524	3.39E-08	1.19E-05	1.00E-05	7.40E-05		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	1.03E-07	1.11E-05	8.92E-06	7.10E-05		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	2.40E-07	1.03E-05	1.09E-05	6.60E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	1.65E-06	9.56E-06	2.86E-05	6.12E-05		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	7.84E-06	8.85E-06	8.59E-05	5.64E-05		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	1.19E-05	7.88E-06	1.24E-04	5.13E-05		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	7.39E-06	7.06E-06	7.84E-05	4.70E-05		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	2.34E-06	6.75E-06	3.32E-05	4.34E-05		756	1.57E-07	1.57E-07	1.57E-07	1.57E-07
556	2.51E-07	6.16E-06	1.20E-05	3.94E-05		760	1.71E-07	1.71E-07	1.71E-07	1.71E-07
560	3.27E-08	5.40E-06	3.94E-06	3.59E-05		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	3.31E-08	4.44E-06	1.85E-06	3.23E-05		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	3.34E-08	3.19E-06	1.38E-06	2.86E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	2.66E-06	1.82E-06	2.53E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	3.31E-08	2.24E-06	5.01E-06	2.27E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.95E-07	1.69E-06	9.54E-06	2.01E-05						

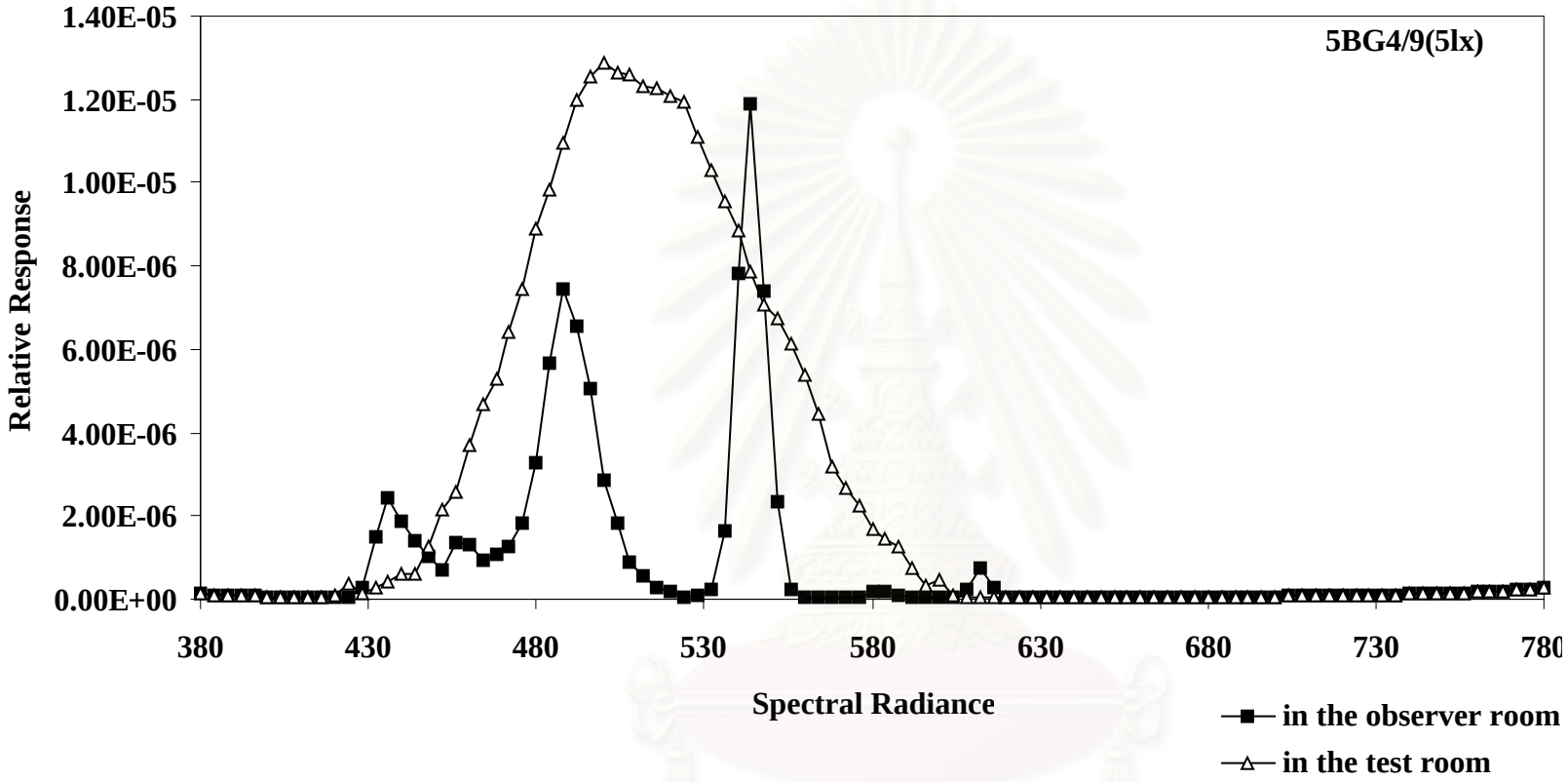


Fig.F11a Compairison between the spatral of the color chart 5BG4/9 measured at the border of RVSI in the test room and at 5 lux in the observer room.

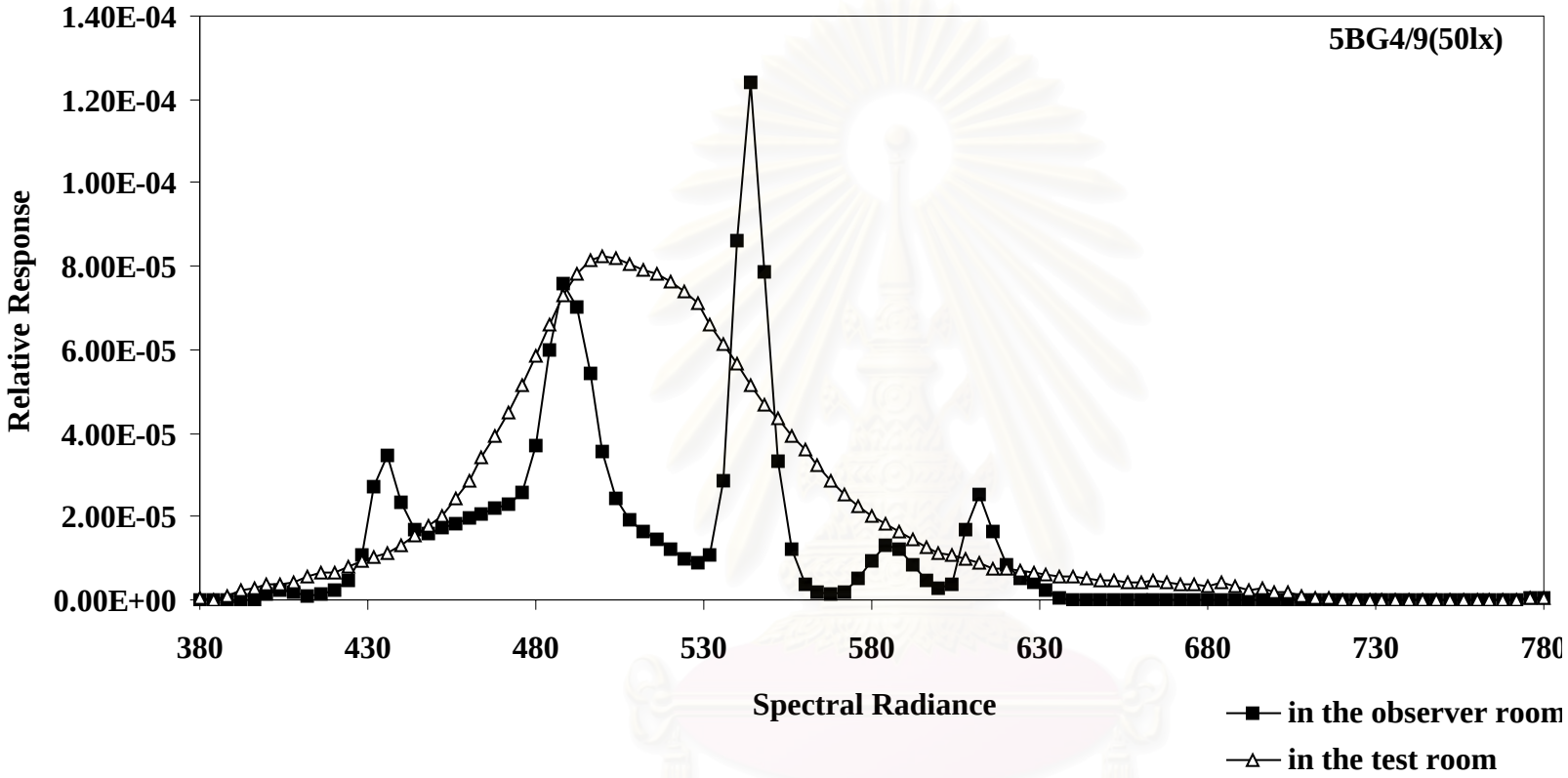


Fig.F-11b Compairison between the spatral of the color chart 5BG4/9 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-12 The spectral distribution data of 10BG4/9 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.97E-07	5.08E-07		584	1.42E-07	1.39E-06	1.25E-05	1.62E-05
384	1.09E-07	1.09E-07	1.09E-07	6.34E-07		588	5.27E-08	1.03E-06	1.17E-05	1.42E-05
388	9.16E-08	9.16E-08	9.16E-08	1.32E-06		592	9.62E-08	7.91E-07	8.18E-06	1.35E-05
392	7.96E-08	7.96E-08	7.96E-08	2.61E-06		596	3.40E-08	5.65E-07	4.99E-06	1.25E-05
396	7.47E-08	7.47E-08	4.25E-07	3.71E-06		600	3.48E-08	6.14E-07	3.13E-06	1.14E-05
400	6.86E-08	6.86E-08	2.60E-06	4.78E-06		604	5.82E-08	5.41E-07	4.07E-06	1.06E-05
404	6.21E-08	6.21E-08	3.62E-06	5.53E-06		608	7.36E-07	3.65E-08	1.86E-05	1.01E-05
408	5.81E-08	2.17E-07	2.20E-06	6.96E-06		612	1.39E-06	3.69E-08	2.76E-05	9.10E-06
412	5.67E-08	1.51E-07	1.32E-06	8.41E-06		616	5.21E-07	3.73E-08	1.83E-05	8.75E-06
416	5.58E-08	1.89E-07	2.47E-06	9.72E-06		620	3.75E-08	3.75E-08	9.62E-06	8.37E-06
420	9.99E-08	4.86E-07	4.10E-06	1.01E-05		624	3.78E-08	3.78E-08	6.26E-06	7.54E-06
424	5.01E-08	8.40E-08	7.04E-06	1.13E-05		628	3.82E-08	3.82E-08	5.19E-06	7.07E-06
428	4.88E-07	5.66E-07	1.53E-05	1.33E-05		632	3.88E-08	3.88E-08	3.54E-06	6.61E-06
432	2.77E-06	1.63E-06	3.91E-05	1.47E-05		636	3.94E-08	3.94E-08	1.03E-06	6.36E-06
436	4.11E-06	1.92E-06	5.03E-05	1.74E-05		640	4.03E-08	4.03E-08	7.86E-08	5.98E-06
440	2.78E-06	1.63E-06	3.43E-05	2.04E-05		644	4.15E-08	4.15E-08	4.15E-08	5.54E-06
444	1.77E-06	2.31E-06	2.40E-05	2.32E-05		648	4.29E-08	4.29E-08	8.87E-08	6.00E-06
448	1.27E-06	3.59E-06	2.39E-05	2.54E-05		652	4.45E-08	4.45E-08	1.06E-07	6.06E-06
452	1.62E-06	4.32E-06	2.54E-05	2.95E-05		656	4.62E-08	4.62E-08	4.62E-08	5.60E-06
456	1.85E-06	5.16E-06	2.57E-05	3.43E-05		660	4.79E-08	4.79E-08	4.79E-08	5.42E-06
460	1.88E-06	6.61E-06	2.69E-05	4.01E-05		664	4.96E-08	4.96E-08	4.96E-08	5.76E-06
464	1.71E-06	7.91E-06	2.79E-05	4.63E-05		668	5.11E-08	5.11E-08	5.11E-08	5.43E-06
468	2.17E-06	9.24E-06	2.90E-05	5.27E-05		672	5.25E-08	5.25E-08	5.25E-08	5.06E-06
472	2.46E-06	1.03E-05	2.95E-05	5.84E-05		676	5.40E-08	5.40E-08	5.40E-08	4.60E-06
476	2.56E-06	1.10E-05	3.24E-05	6.47E-05		680	5.56E-08	5.56E-08	5.56E-08	4.24E-06
480	3.92E-06	1.25E-05	4.46E-05	7.10E-05		684	5.73E-08	5.73E-08	5.73E-08	3.96E-06
484	6.69E-06	1.40E-05	7.13E-05	7.78E-05		688	5.92E-08	5.92E-08	5.92E-08	3.66E-06
488	8.33E-06	1.51E-05	8.82E-05	8.36E-05		692	6.12E-08	6.12E-08	6.12E-08	3.29E-06
492	7.39E-06	1.58E-05	8.04E-05	8.81E-05		696	6.40E-08	6.40E-08	6.40E-08	2.72E-06
496	5.78E-06	1.58E-05	6.08E-05	8.92E-05		700	6.74E-08	6.74E-08	6.74E-08	1.97E-06
500	3.16E-06	1.58E-05	3.94E-05	8.89E-05		704	7.09E-08	7.09E-08	7.09E-08	1.15E-06
504	2.17E-06	1.52E-05	2.64E-05	8.69E-05		708	7.50E-08	7.50E-08	7.50E-08	9.98E-07
508	9.29E-07	1.49E-05	2.07E-05	8.42E-05		712	8.05E-08	8.05E-08	8.05E-08	2.08E-07
512	8.10E-07	1.48E-05	1.77E-05	8.16E-05		716	8.59E-08	8.59E-08	8.59E-08	8.59E-08
516	3.55E-07	1.45E-05	1.50E-05	7.93E-05		720	9.16E-08	9.16E-08	9.16E-08	2.60E-07
520	5.60E-08	1.37E-05	1.22E-05	7.61E-05		724	9.77E-08	9.77E-08	9.77E-08	1.51E-07
524	2.00E-07	1.26E-05	1.01E-05	7.22E-05		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	4.57E-08	1.21E-05	9.06E-06	6.74E-05		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	2.19E-07	1.11E-05	1.06E-05	6.22E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	1.87E-06	1.01E-05	2.72E-05	5.68E-05		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	7.29E-06	9.12E-06	8.01E-05	5.13E-05		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	1.11E-05	8.08E-06	1.15E-04	4.63E-05		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	6.91E-06	7.15E-06	7.26E-05	4.13E-05		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	2.35E-06	6.41E-06	3.03E-05	3.73E-05		756	1.57E-07	1.57E-07	1.57E-07	1.57E-07
556	4.02E-07	5.50E-06	1.07E-05	3.35E-05		760	1.71E-07	1.71E-07	1.71E-07	1.71E-07
560	3.27E-08	4.79E-06	3.42E-06	3.03E-05		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	3.31E-08	4.18E-06	1.77E-06	2.70E-05		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	3.34E-08	3.61E-06	8.68E-07	2.37E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	2.85E-06	1.93E-06	2.13E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	3.31E-08	1.99E-06	4.80E-06	1.92E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	3.28E-08	1.83E-06	8.79E-06	1.75E-05						

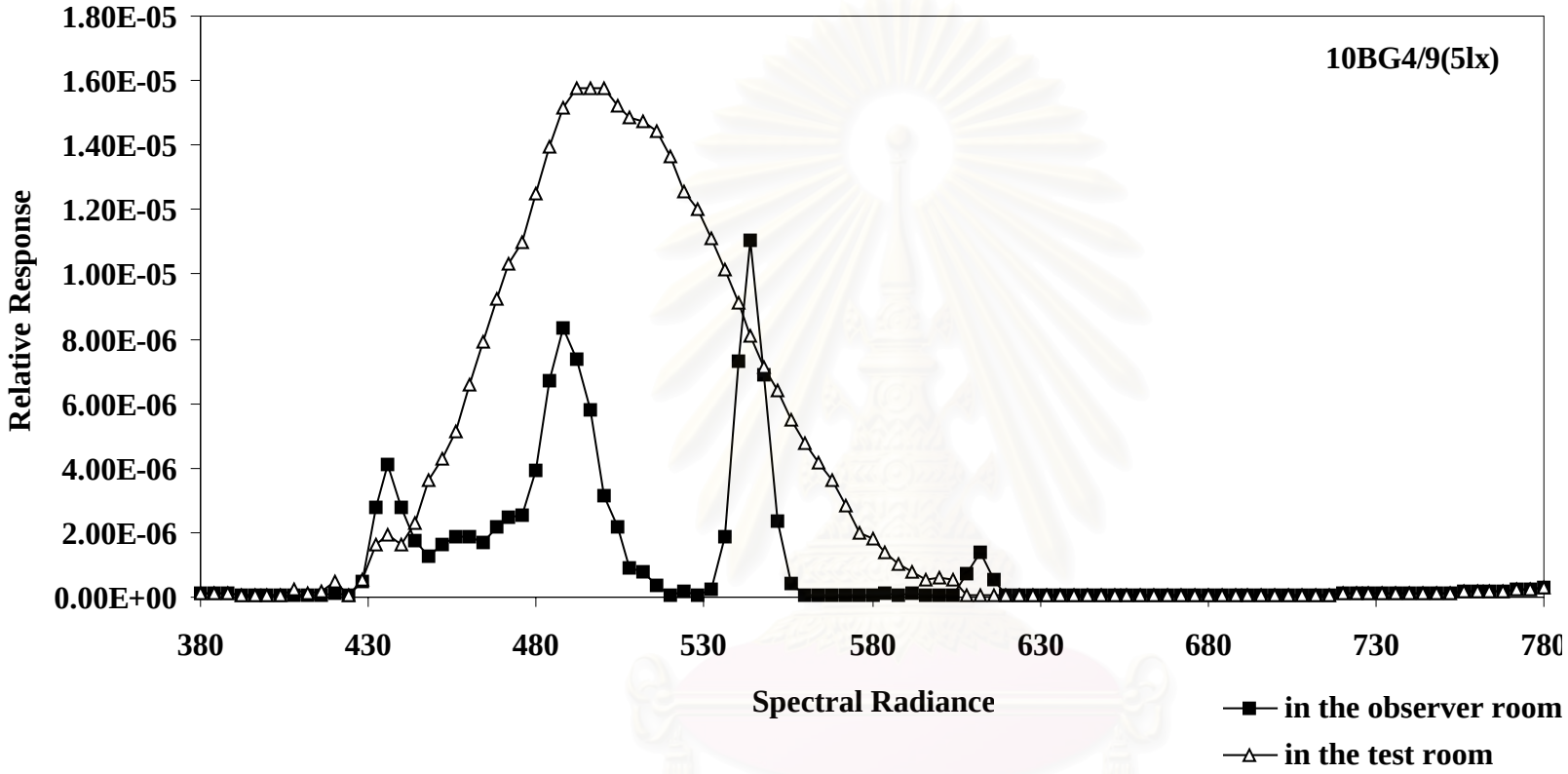


Fig.F-12a Compairison between the spatral of the color chart 10BG4/9 measured at the border of RVSI
in the test room and at 5 lux in the observer room

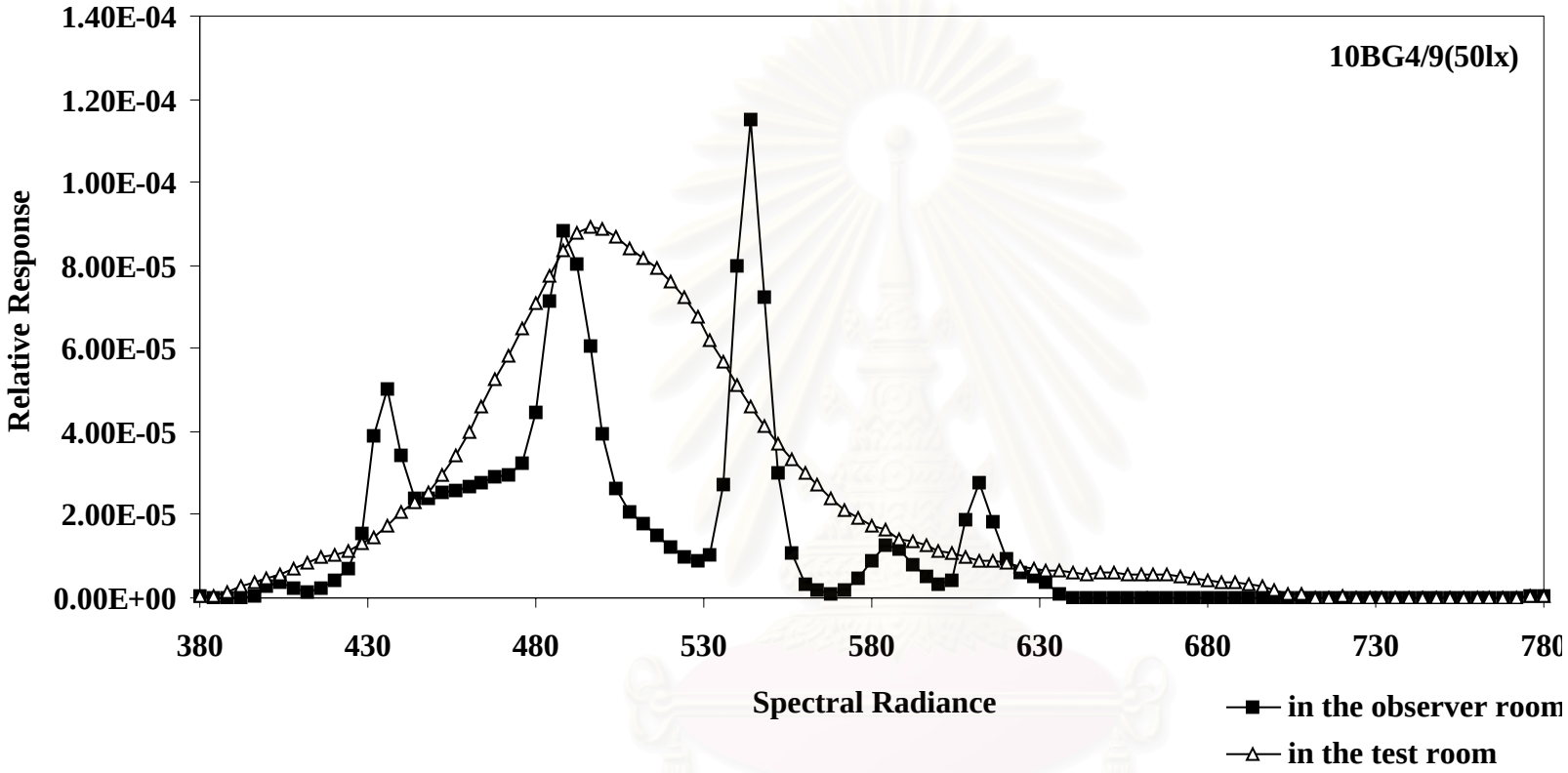


Fig.F-12b Compairison between the spatral of the color chart 10BG4/9 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-13 The spectral distribution data of 5B4/9 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.89E-07	1.33E-07	1.33E-07		584	3.96E-08	1.25E-06	1.12E-05	1.59E-05
384	3.40E-07	7.11E-07	1.09E-07	1.09E-07		588	1.90E-07	1.19E-06	1.06E-05	1.49E-05
388	1.40E-07	2.24E-06	9.16E-08	9.16E-08		592	3.33E-08	9.90E-07	7.31E-06	1.41E-05
392	8.45E-08	3.76E-06	2.20E-07	7.96E-08		596	3.40E-08	6.88E-07	4.45E-06	1.32E-05
396	5.27E-07	5.39E-06	7.47E-08	7.47E-08		600	3.48E-08	5.06E-07	2.86E-06	1.26E-05
400	3.61E-06	6.64E-06	6.86E-08	6.86E-08		604	4.78E-08	4.72E-07	4.27E-06	1.18E-05
404	5.97E-06	8.76E-06	6.21E-08	6.21E-08		608	6.78E-07	2.92E-07	1.82E-05	1.09E-05
408	3.74E-06	1.09E-05	5.81E-08	5.97E-07		612	1.72E-06	3.69E-08	2.65E-05	1.01E-05
412	2.53E-06	1.30E-05	5.67E-08	1.02E-06		616	5.37E-07	3.73E-08	1.77E-05	9.50E-06
416	3.42E-06	1.49E-05	5.58E-08	1.23E-06		620	3.75E-08	3.75E-08	9.21E-06	9.15E-06
420	5.99E-06	1.65E-05	5.33E-08	1.10E-06		624	3.78E-08	1.62E-07	6.00E-06	8.56E-06
424	9.58E-06	1.82E-05	2.02E-07	1.58E-06		628	3.82E-08	3.82E-08	4.69E-06	8.36E-06
428	2.13E-05	2.12E-05	1.49E-06	2.39E-06		632	3.88E-08	3.88E-08	3.18E-06	8.19E-06
432	5.48E-05	2.43E-05	4.53E-06	2.67E-06		636	3.94E-08	3.94E-08	9.98E-07	7.81E-06
436	7.01E-05	2.79E-05	6.61E-06	2.92E-06		640	4.03E-08	4.03E-08	1.02E-07	7.24E-06
440	4.79E-05	3.17E-05	4.28E-06	3.56E-06		644	4.15E-08	4.15E-08	5.58E-08	7.07E-06
444	3.40E-05	3.48E-05	2.45E-06	4.23E-06		648	4.29E-08	4.29E-08	9.81E-08	7.21E-06
448	3.29E-05	3.88E-05	2.13E-06	5.09E-06		652	4.45E-08	4.45E-08	3.81E-07	6.78E-06
452	3.40E-05	4.38E-05	2.82E-06	6.50E-06		656	4.62E-08	4.62E-08	2.24E-07	6.77E-06
456	3.48E-05	4.90E-05	2.95E-06	7.72E-06		660	4.79E-08	4.79E-08	1.65E-07	6.59E-06
460	3.50E-05	5.48E-05	3.18E-06	9.30E-06		664	4.96E-08	4.96E-08	4.96E-08	6.59E-06
464	3.50E-05	6.04E-05	2.48E-06	1.04E-05		668	5.11E-08	5.11E-08	5.11E-08	6.33E-06
468	3.49E-05	6.56E-05	2.48E-06	1.13E-05		672	5.25E-08	5.25E-08	5.25E-08	5.44E-06
472	3.48E-05	7.03E-05	2.56E-06	1.24E-05		676	5.40E-08	5.40E-08	5.40E-08	5.11E-06
476	3.58E-05	7.45E-05	2.51E-06	1.29E-05		680	5.56E-08	5.56E-08	5.56E-08	5.26E-06
480	4.75E-05	7.92E-05	4.06E-06	1.40E-05		684	5.73E-08	5.73E-08	5.73E-08	4.99E-06
484	7.37E-05	8.37E-05	6.78E-06	1.47E-05		688	5.92E-08	5.92E-08	5.92E-08	3.99E-06
488	8.99E-05	8.80E-05	8.57E-06	1.53E-05		692	6.12E-08	6.12E-08	6.12E-08	4.14E-06
492	8.08E-05	9.07E-05	7.65E-06	1.56E-05		696	6.40E-08	6.40E-08	6.40E-08	3.07E-06
496	6.09E-05	9.08E-05	5.56E-06	1.53E-05		700	6.74E-08	6.74E-08	6.74E-08	2.37E-06
500	3.83E-05	8.96E-05	3.13E-06	1.52E-05		704	7.09E-08	7.09E-08	7.09E-08	1.55E-06
504	2.58E-05	8.69E-05	1.94E-06	1.50E-05		708	7.50E-08	7.50E-08	4.95E-07	6.24E-07
508	1.97E-05	8.39E-05	1.22E-06	1.45E-05		712	8.05E-08	8.05E-08	8.05E-08	4.63E-07
512	1.69E-05	8.12E-05	1.01E-06	1.40E-05		716	8.59E-08	8.59E-08	8.59E-08	8.59E-08
516	1.45E-05	7.84E-05	6.27E-07	1.38E-05		720	9.16E-08	9.16E-08	9.16E-08	9.16E-08
520	1.21E-05	7.53E-05	9.15E-08	1.32E-05		724	9.77E-08	9.77E-08	9.77E-08	9.77E-08
524	9.65E-06	7.03E-05	3.39E-08	1.22E-05		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	8.40E-06	6.59E-05	3.43E-08	1.11E-05		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	9.67E-06	6.07E-05	3.43E-08	1.02E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	2.54E-05	5.53E-05	1.56E-06	9.30E-06		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	7.51E-05	4.97E-05	6.73E-06	8.54E-06		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	1.07E-04	4.46E-05	1.04E-05	7.77E-06		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	6.76E-05	4.00E-05	6.43E-06	6.62E-06		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	2.81E-05	3.63E-05	2.18E-06	6.05E-06		756	1.57E-07	1.57E-07	1.57E-07	2.79E-07
556	9.80E-06	3.26E-05	2.24E-07	5.10E-06		760	1.71E-07	1.71E-07	1.71E-07	8.42E-07
560	3.53E-06	2.92E-05	3.27E-08	4.35E-06		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	1.51E-06	2.58E-05	3.31E-08	3.46E-06		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	9.25E-07	2.27E-05	3.34E-08	2.98E-06		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	1.58E-06	2.03E-05	3.34E-08	2.40E-06		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	4.10E-06	1.88E-05	3.31E-08	1.97E-06		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	8.01E-06	1.72E-05	3.28E-08	1.52E-06						

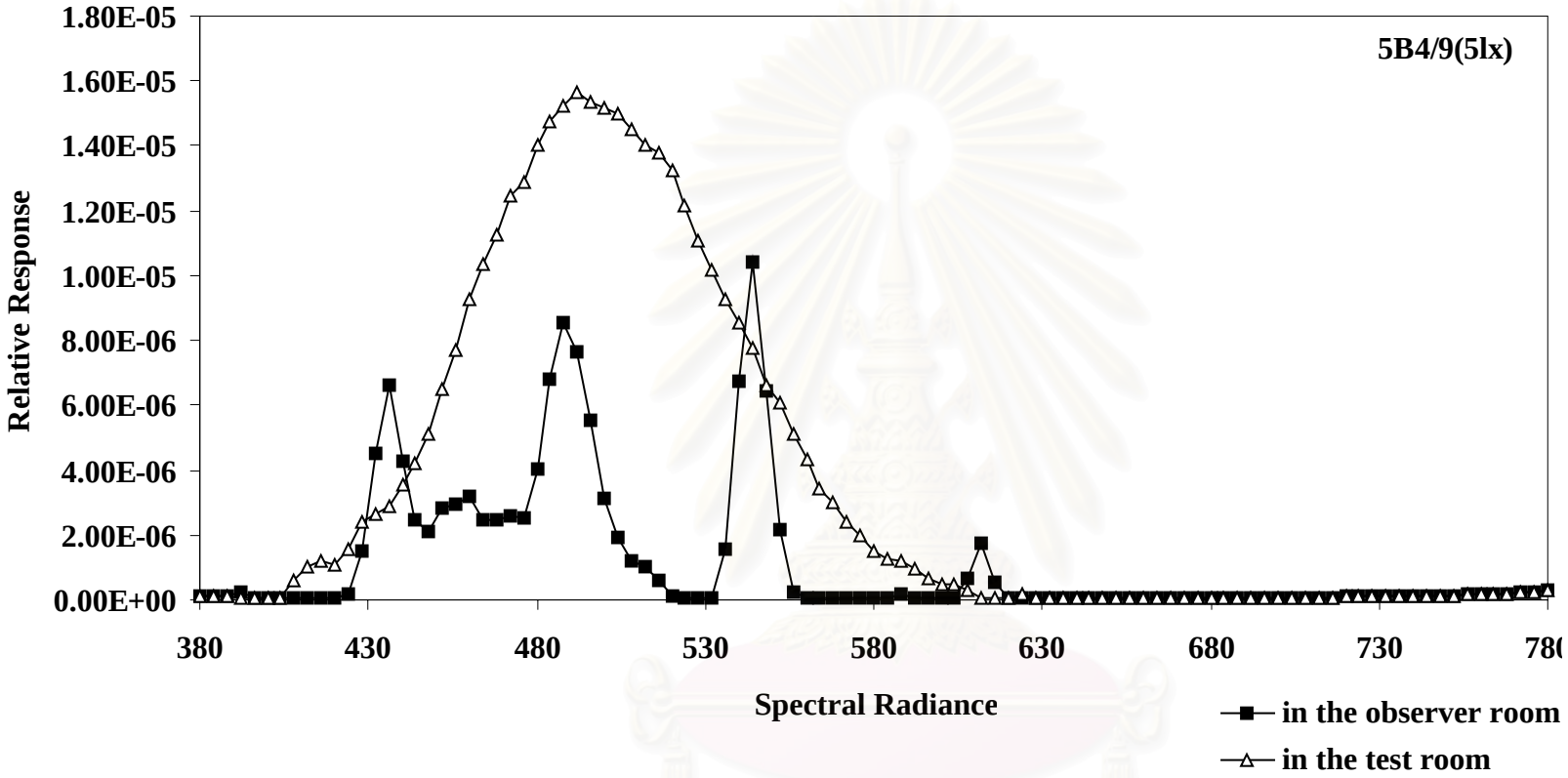


Fig.F-13a Compairison between the spatral of the color chart 5B4/9 measured at the border of RVSI in the test room and at 5 lux in the observer room

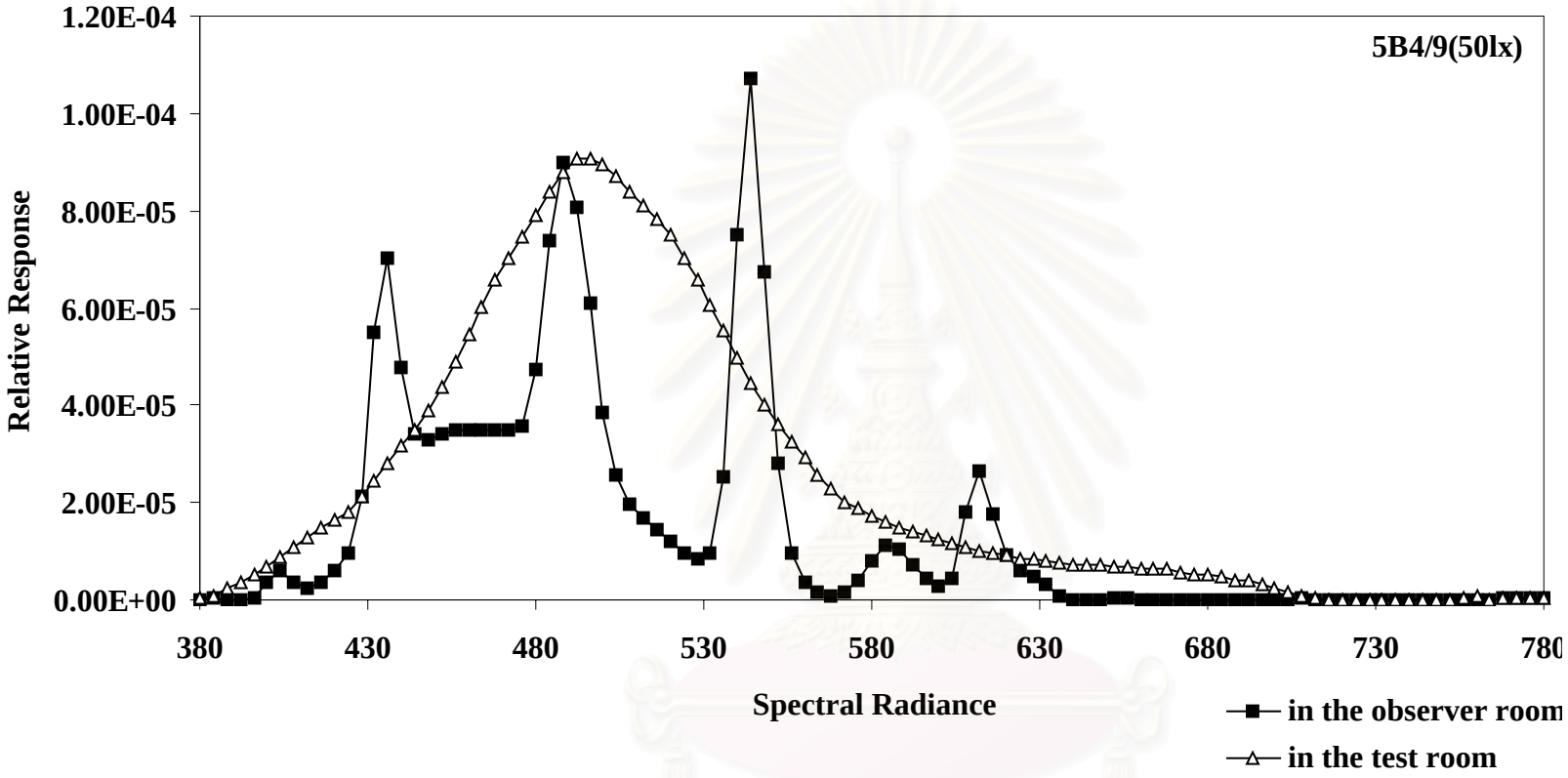


Fig.F-13b Compairison between the spatral of the color chart 5B4/9 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-14 The spectral distribution data of 10B4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	5.24E-07	1.75E-06		584	9.32E-08	1.68E-06	1.21E-05	1.72E-05
384	1.09E-07	1.09E-07	7.31E-07	1.98E-06		588	1.64E-07	1.33E-06	1.15E-05	1.66E-05
388	9.16E-08	9.16E-08	1.89E-07	2.99E-06		592	3.33E-08	1.17E-06	8.17E-06	1.57E-05
392	7.96E-08	7.96E-08	7.96E-08	5.79E-06		596	3.40E-08	8.56E-07	5.15E-06	1.54E-05
396	7.47E-08	7.47E-08	6.01E-07	8.28E-06		600	3.48E-08	5.59E-07	3.25E-06	1.48E-05
400	6.86E-08	1.51E-07	4.67E-06	1.10E-05		604	6.86E-08	7.54E-07	4.38E-06	1.39E-05
404	6.21E-08	7.31E-07	7.63E-06	1.45E-05		608	1.02E-06	2.07E-07	2.00E-05	1.27E-05
408	5.81E-08	1.73E-06	4.75E-06	1.80E-05		612	1.79E-06	5.14E-08	2.99E-05	1.23E-05
412	9.46E-08	1.87E-06	3.31E-06	2.10E-05		616	6.18E-07	2.02E-07	1.99E-05	1.19E-05
416	6.74E-08	1.86E-06	5.58E-06	2.30E-05		620	3.75E-08	1.33E-07	1.05E-05	1.17E-05
420	6.00E-08	2.75E-06	9.28E-06	2.46E-05		624	3.78E-08	4.08E-08	6.95E-06	1.12E-05
424	2.77E-07	2.89E-06	1.43E-05	2.72E-05		628	3.82E-08	3.82E-08	5.48E-06	1.07E-05
428	1.76E-06	3.38E-06	3.01E-05	3.04E-05		632	3.88E-08	3.88E-08	3.71E-06	1.03E-05
432	6.75E-06	3.83E-06	7.60E-05	3.47E-05		636	3.94E-08	3.94E-08	1.15E-06	9.67E-06
436	9.18E-06	4.27E-06	9.78E-05	4.00E-05		640	4.03E-08	4.03E-08	9.39E-08	9.59E-06
440	6.16E-06	5.34E-06	6.75E-05	4.52E-05		644	4.15E-08	4.15E-08	1.92E-07	9.40E-06
444	4.44E-06	6.23E-06	4.70E-05	4.92E-05		648	4.29E-08	4.29E-08	9.59E-07	9.05E-06
448	3.29E-06	7.25E-06	4.43E-05	5.30E-05		652	4.45E-08	4.45E-08	8.07E-07	9.41E-06
452	3.26E-06	8.37E-06	4.41E-05	5.65E-05		656	4.62E-08	4.62E-08	3.12E-07	9.89E-06
456	3.33E-06	9.43E-06	4.30E-05	6.12E-05		660	4.79E-08	4.79E-08	6.08E-08	9.86E-06
460	3.37E-06	1.10E-05	4.12E-05	6.57E-05		664	4.96E-08	4.96E-08	4.96E-08	9.49E-06
464	3.44E-06	1.20E-05	3.93E-05	6.90E-05		668	5.11E-08	5.11E-08	5.11E-08	8.94E-06
468	3.22E-06	1.25E-05	3.72E-05	7.15E-05		672	5.25E-08	5.25E-08	5.25E-08	8.31E-06
472	2.83E-06	1.27E-05	3.58E-05	7.33E-05		676	5.40E-08	5.40E-08	5.40E-08	7.86E-06
476	2.95E-06	1.29E-05	3.52E-05	7.57E-05		680	5.56E-08	5.56E-08	5.56E-08	7.36E-06
480	3.71E-06	1.30E-05	4.56E-05	7.80E-05		684	5.73E-08	5.73E-08	5.73E-08	6.46E-06
484	6.00E-06	1.33E-05	6.96E-05	8.04E-05		688	5.92E-08	5.92E-08	5.92E-08	5.67E-06
488	8.10E-06	1.39E-05	8.37E-05	8.34E-05		692	6.12E-08	6.12E-08	6.12E-08	4.63E-06
492	7.42E-06	1.41E-05	7.47E-05	8.51E-05		696	6.40E-08	6.40E-08	6.40E-08	3.31E-06
496	4.76E-06	1.42E-05	5.58E-05	8.49E-05		700	6.74E-08	6.74E-08	6.74E-08	2.79E-06
500	2.44E-06	1.38E-05	3.53E-05	8.37E-05		704	7.09E-08	7.09E-08	7.09E-08	2.89E-06
504	1.63E-06	1.33E-05	2.35E-05	8.15E-05		708	7.50E-08	7.50E-08	3.76E-07	2.18E-06
508	1.11E-06	1.30E-05	1.90E-05	7.93E-05		712	8.05E-08	8.05E-08	2.08E-07	1.13E-06
512	6.22E-07	1.30E-05	1.66E-05	7.73E-05		716	8.59E-08	8.59E-08	8.59E-08	1.24E-06
516	5.44E-07	1.25E-05	1.36E-05	7.49E-05		720	9.16E-08	9.16E-08	9.16E-08	1.26E-06
520	9.92E-08	1.21E-05	1.09E-05	7.23E-05		724	9.77E-08	9.77E-08	9.77E-08	3.10E-07
524	3.39E-08	1.14E-05	9.33E-06	6.88E-05		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	3.43E-08	1.08E-05	8.17E-06	6.52E-05		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	1.85E-07	9.70E-06	9.40E-06	6.08E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	1.90E-06	8.85E-06	2.51E-05	5.57E-05		740	1.23E-07	1.23E-07	1.23E-07	1.39E-07
540	6.91E-06	8.34E-06	7.51E-05	5.10E-05		744	1.30E-07	1.30E-07	1.30E-07	3.19E-07
544	1.06E-05	7.63E-06	1.08E-04	4.60E-05		748	1.38E-07	1.38E-07	1.38E-07	1.01E-06
548	6.32E-06	6.73E-06	6.79E-05	4.17E-05		752	1.46E-07	1.46E-07	1.46E-07	1.13E-06
552	2.33E-06	5.91E-06	2.85E-05	3.80E-05		756	1.57E-07	1.57E-07	1.57E-07	3.58E-06
556	4.15E-07	5.27E-06	9.85E-06	3.43E-05		760	1.71E-07	1.71E-07	1.71E-07	5.40E-06
560	3.27E-08	4.51E-06	3.26E-06	3.09E-05		764	1.85E-07	1.85E-07	1.85E-07	6.39E-06
564	3.31E-08	3.71E-06	1.56E-06	2.76E-05		768	2.01E-07	2.01E-07	2.01E-07	7.83E-06
568	3.34E-08	3.28E-06	1.01E-06	2.46E-05		772	2.24E-07	2.24E-07	2.24E-07	8.20E-06
572	3.34E-08	2.58E-06	1.80E-06	2.23E-05		776	2.47E-07	2.47E-07	2.47E-07	5.30E-06
576	3.31E-08	1.97E-06	4.28E-06	2.03E-05		780	2.77E-07	2.77E-07	2.77E-07	5.18E-06
580	3.28E-08	1.80E-06	8.54E-06	1.88E-05						

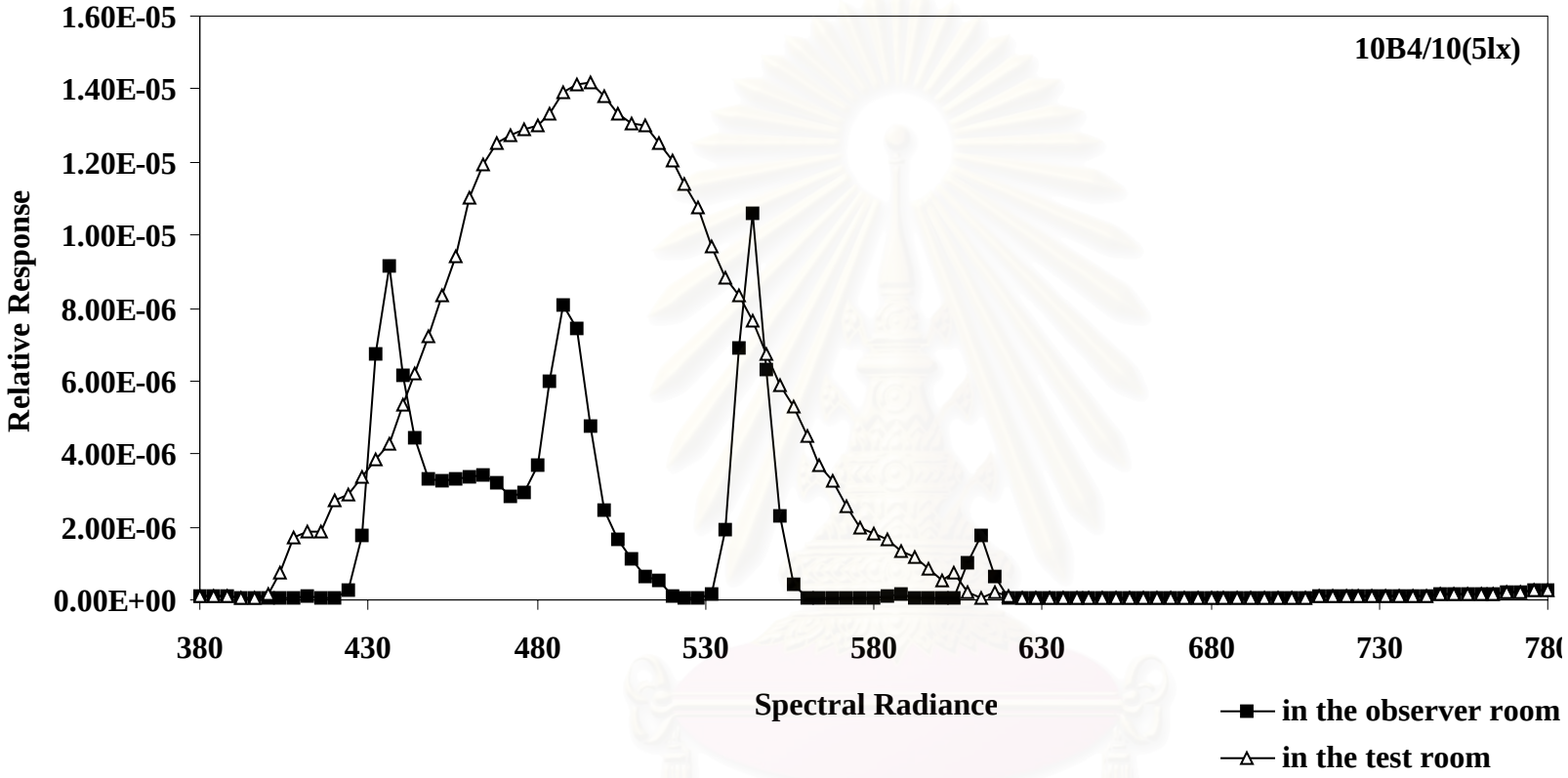


Fig.F-14a Compairison between the spatral of the color chart 10B4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

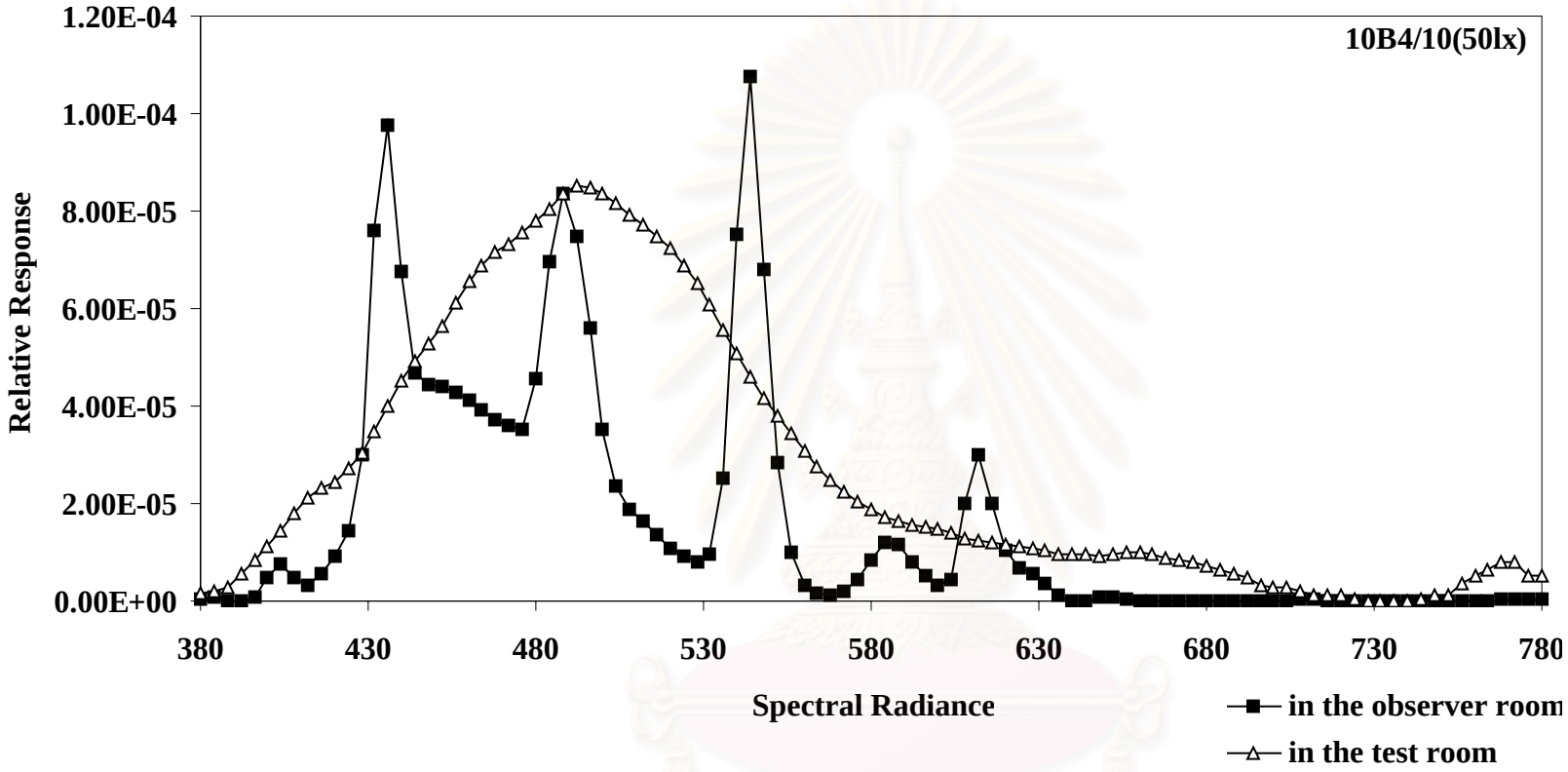


Fig.F-14b Compairison between the spatral of the color chart 10B4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-15 The spectral distribution data of 5PB4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	2.20E-06		584	5.51E-07	4.06E-06	1.79E-05	2.93E-05
384	7.24E-07	1.09E-07	2.63E-07	3.91E-06		588	5.38E-07	4.13E-06	1.78E-05	2.84E-05
388	2.21E-07	9.16E-08	1.24E-07	6.12E-06		592	2.22E-07	3.89E-06	1.26E-05	2.82E-05
392	7.96E-08	8.45E-08	8.93E-08	7.49E-06		596	3.40E-08	3.69E-06	7.96E-06	2.73E-05
396	7.47E-08	2.17E-07	9.53E-07	1.05E-05		600	3.48E-08	3.95E-06	5.52E-06	2.65E-05
400	6.86E-08	7.28E-07	6.08E-06	1.39E-05		604	9.10E-08	3.45E-06	7.30E-06	2.60E-05
404	6.21E-08	1.50E-06	9.96E-06	1.75E-05		608	1.68E-06	3.22E-06	3.05E-05	2.48E-05
408	5.81E-08	2.02E-06	7.37E-06	2.19E-05		612	3.07E-06	2.73E-06	4.55E-05	2.37E-05
412	5.67E-08	2.57E-06	5.50E-06	2.59E-05		616	1.72E-06	2.42E-06	3.05E-05	2.26E-05
416	5.58E-08	3.04E-06	6.76E-06	2.86E-05		620	2.98E-07	2.51E-06	1.67E-05	2.20E-05
420	8.71E-08	2.93E-06	1.07E-05	3.04E-05		624	3.78E-08	2.40E-06	1.14E-05	2.11E-05
424	9.97E-07	3.98E-06	1.69E-05	3.39E-05		628	3.82E-08	1.89E-06	9.22E-06	2.08E-05
428	2.84E-06	4.94E-06	3.52E-05	3.75E-05		632	3.88E-08	2.01E-06	6.23E-06	2.04E-05
432	7.75E-06	5.33E-06	8.94E-05	4.17E-05		636	3.94E-08	2.08E-06	2.50E-06	1.99E-05
436	1.06E-05	5.99E-06	1.14E-04	4.61E-05		640	4.03E-08	2.25E-06	8.28E-07	1.94E-05
440	7.07E-06	6.54E-06	7.67E-05	5.03E-05		644	4.15E-08	1.77E-06	8.15E-07	1.93E-05
444	4.35E-06	7.23E-06	5.19E-05	5.39E-05		648	4.29E-08	1.70E-06	1.26E-06	2.00E-05
448	3.98E-06	8.61E-06	4.76E-05	5.60E-05		652	4.45E-08	1.50E-06	1.56E-06	2.05E-05
452	3.49E-06	9.31E-06	4.63E-05	5.94E-05		656	4.62E-08	1.64E-06	6.16E-07	2.09E-05
456	3.63E-06	1.04E-05	4.45E-05	6.36E-05		660	4.79E-08	1.59E-06	5.37E-07	2.16E-05
460	3.18E-06	1.13E-05	4.23E-05	6.69E-05		664	4.96E-08	1.10E-06	7.03E-07	2.10E-05
464	2.96E-06	1.19E-05	3.97E-05	6.91E-05		668	5.11E-08	1.42E-06	4.06E-07	2.04E-05
468	2.90E-06	1.20E-05	3.72E-05	7.01E-05		672	5.25E-08	1.45E-06	1.94E-07	1.97E-05
472	2.53E-06	1.21E-05	3.50E-05	7.04E-05		676	5.40E-08	1.42E-06	5.40E-08	1.90E-05
476	2.42E-06	1.22E-05	3.37E-05	6.94E-05		680	5.56E-08	8.48E-07	5.56E-08	1.76E-05
480	3.30E-06	1.22E-05	4.19E-05	6.98E-05		684	5.73E-08	5.97E-07	5.73E-08	1.61E-05
484	5.65E-06	1.19E-05	6.15E-05	7.01E-05		688	5.92E-08	1.04E-07	5.92E-08	1.46E-05
488	6.75E-06	1.18E-05	7.25E-05	7.00E-05		692	6.12E-08	6.12E-08	6.12E-08	1.29E-05
492	5.61E-06	1.18E-05	6.31E-05	6.91E-05		696	6.40E-08	6.40E-08	6.40E-08	1.11E-05
496	3.83E-06	1.16E-05	4.59E-05	6.69E-05		700	6.74E-08	6.74E-08	6.74E-08	1.04E-05
500	1.60E-06	1.08E-05	2.82E-05	6.44E-05		704	7.09E-08	7.09E-08	8.45E-07	8.67E-06
504	7.36E-07	1.05E-05	1.84E-05	6.15E-05		708	7.50E-08	7.50E-08	2.14E-06	7.62E-06
508	3.96E-07	9.69E-06	1.40E-05	5.86E-05		712	8.05E-08	8.05E-08	7.81E-07	6.37E-06
512	2.92E-07	9.18E-06	1.18E-05	5.65E-05		716	8.59E-08	8.59E-08	8.59E-08	5.83E-06
516	8.68E-08	8.73E-06	1.02E-05	5.47E-05		720	9.16E-08	9.16E-08	9.16E-08	4.61E-06
520	3.36E-08	8.80E-06	9.03E-06	5.31E-05		724	9.77E-08	9.77E-08	9.77E-08	4.82E-06
524	3.39E-08	8.17E-06	7.32E-06	5.08E-05		728	1.04E-07	1.04E-07	1.04E-07	4.55E-06
528	3.43E-08	8.09E-06	6.61E-06	4.93E-05		732	1.10E-07	1.10E-07	1.10E-07	4.79E-06
532	3.43E-08	7.97E-06	8.32E-06	4.83E-05		736	1.17E-07	1.17E-07	1.17E-07	4.83E-06
536	1.10E-06	7.86E-06	2.32E-05	4.73E-05		740	1.23E-07	1.23E-07	1.23E-07	5.12E-06
540	6.29E-06	7.70E-06	7.21E-05	4.65E-05		744	1.30E-07	1.30E-07	1.30E-07	6.54E-06
544	1.03E-05	7.66E-06	1.07E-04	4.52E-05		748	1.38E-07	1.38E-07	1.38E-07	8.31E-06
548	6.23E-06	7.70E-06	7.01E-05	4.41E-05		752	1.46E-07	1.46E-07	1.46E-07	9.82E-06
552	2.23E-06	7.18E-06	3.10E-05	4.32E-05		756	1.57E-07	1.57E-07	1.57E-07	1.21E-05
556	2.92E-07	6.76E-06	1.17E-05	4.17E-05		760	1.71E-07	1.71E-07	1.71E-07	1.30E-05
560	3.27E-08	6.63E-06	4.46E-06	3.99E-05		764	1.85E-07	1.85E-07	1.85E-07	1.52E-05
564	3.31E-08	6.44E-06	2.40E-06	3.78E-05		768	2.01E-07	2.01E-07	2.01E-07	1.55E-05
568	3.34E-08	5.48E-06	2.01E-06	3.50E-05		772	2.24E-07	2.24E-07	2.24E-07	1.07E-05
572	3.34E-08	4.83E-06	2.83E-06	3.34E-05		776	2.47E-07	2.47E-07	2.47E-07	1.28E-05
576	3.31E-08	4.26E-06	7.05E-06	3.17E-05		780	2.77E-07	2.77E-07	2.77E-07	1.13E-05
580	2.18E-07	4.19E-06	1.30E-05	3.02E-05						

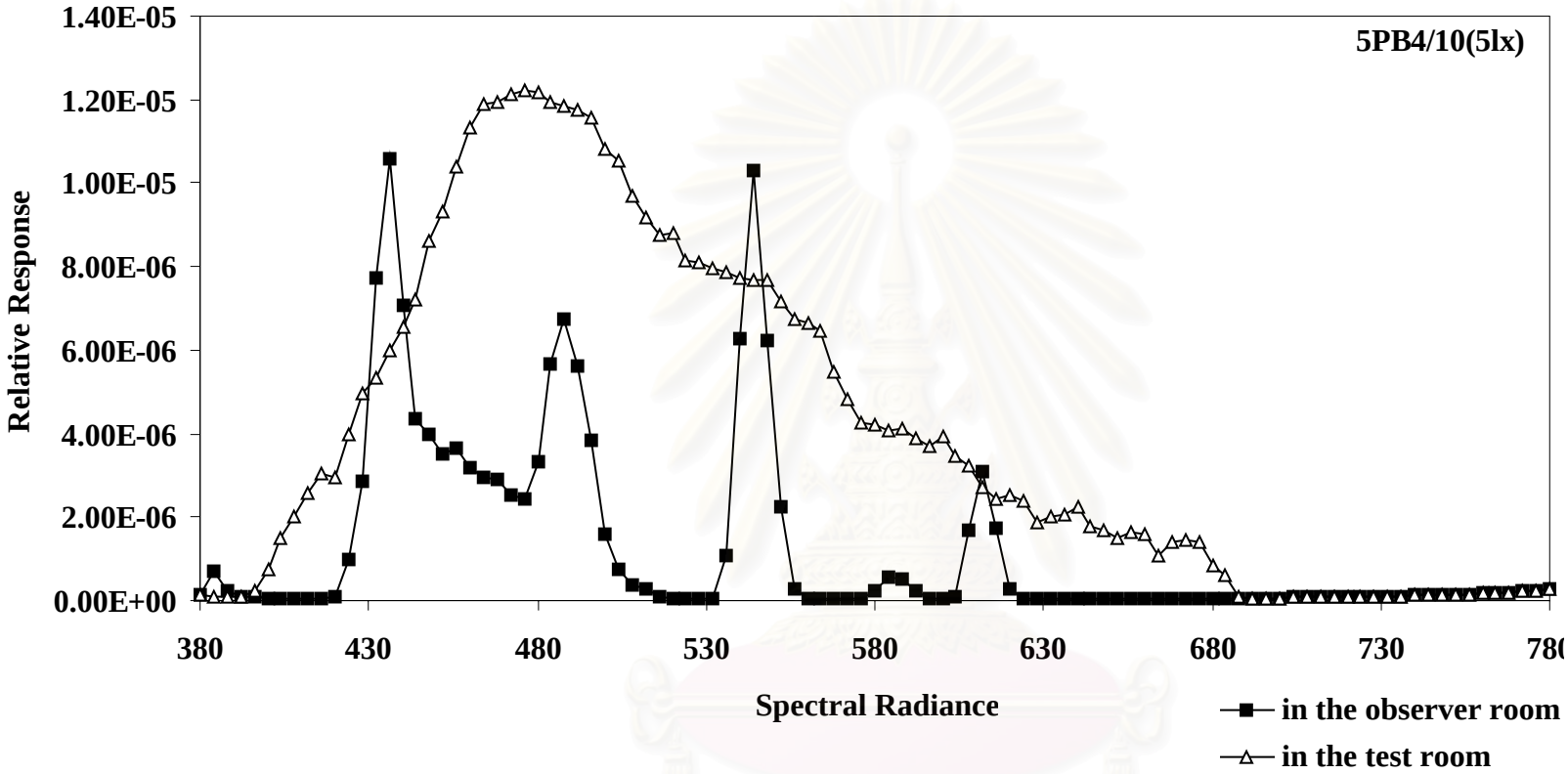


Fig.F-15a Compairison between the spatral of the color chart 5PB4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

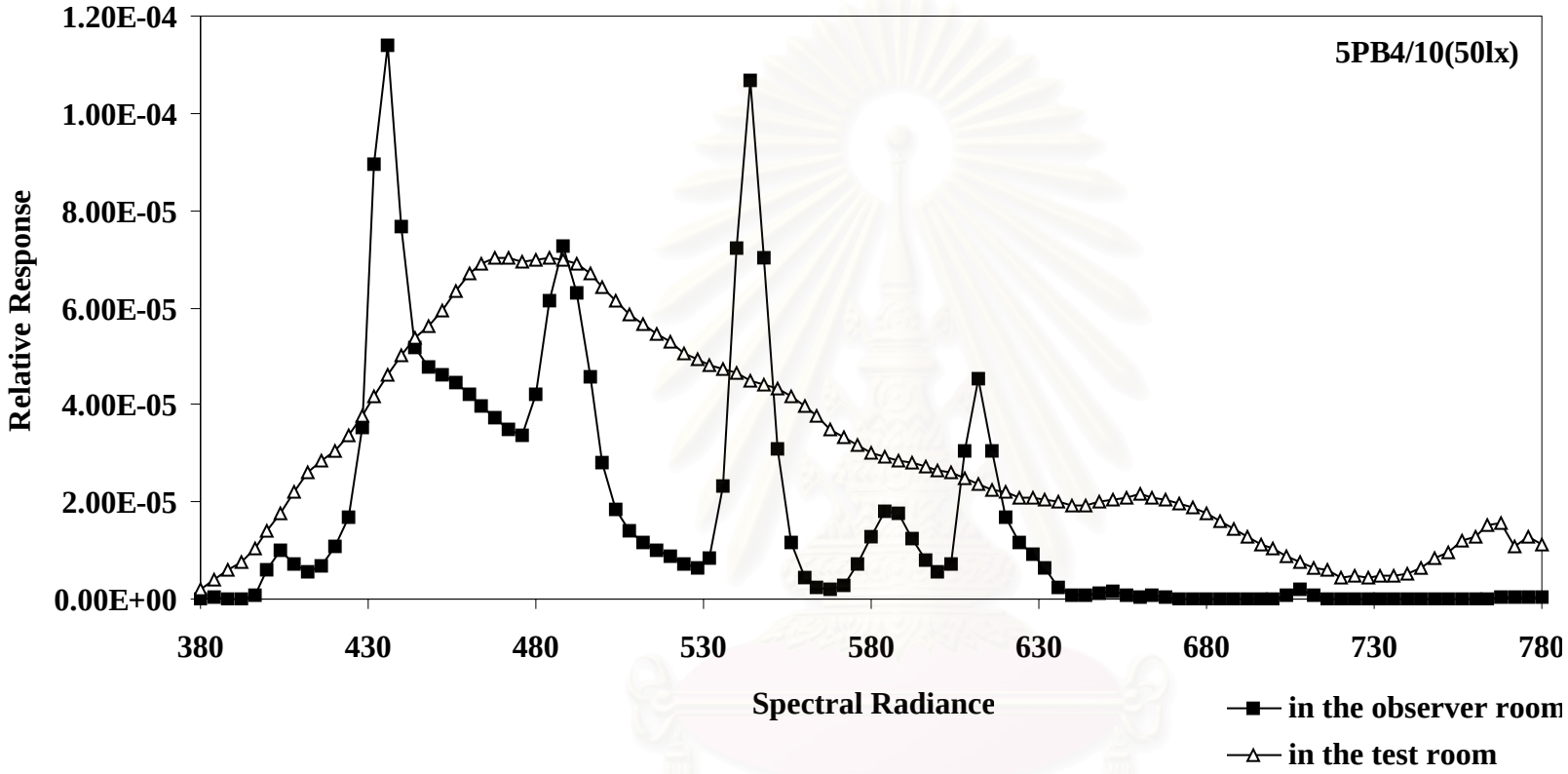


Fig.F-15b Compairison between the spatral of the color chart 5PB4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-16 The spectral distribution data of 10PB4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	6.26E-07	1.86E-06		584	1.52E-06	7.97E-06	2.87E-05	4.45E-05
384	1.09E-07	1.09E-07	1.09E-07	2.83E-06		588	1.57E-06	8.78E-06	2.98E-05	4.74E-05
388	9.16E-08	9.16E-08	9.16E-08	4.95E-06		592	8.10E-07	9.21E-06	2.26E-05	5.00E-05
392	7.96E-08	1.09E-07	7.96E-08	8.12E-06		596	2.23E-07	9.56E-06	1.55E-05	5.23E-05
396	7.47E-08	5.90E-07	8.44E-07	1.14E-05		600	3.48E-08	9.88E-06	1.12E-05	5.37E-05
400	6.86E-08	1.20E-06	6.83E-06	1.50E-05		604	1.88E-07	9.86E-06	1.49E-05	5.43E-05
404	6.21E-08	2.07E-06	1.16E-05	1.91E-05		608	4.15E-06	9.44E-06	6.14E-05	5.27E-05
408	5.81E-08	2.78E-06	7.23E-06	2.33E-05		612	7.04E-06	8.84E-06	8.97E-05	5.07E-05
412	3.98E-07	3.74E-06	4.40E-06	2.68E-05		616	4.41E-06	9.00E-06	6.03E-05	4.87E-05
416	1.60E-07	4.05E-06	7.64E-06	2.93E-05		620	1.98E-06	8.50E-06	3.26E-05	4.67E-05
420	8.93E-08	4.71E-06	1.23E-05	3.08E-05		624	7.11E-07	7.72E-06	2.16E-05	4.56E-05
424	1.01E-06	5.39E-06	1.88E-05	3.33E-05		628	3.54E-07	7.76E-06	1.81E-05	4.45E-05
428	2.86E-06	5.16E-06	3.74E-05	3.68E-05		632	6.01E-08	7.74E-06	1.35E-05	4.43E-05
432	8.24E-06	4.67E-06	9.35E-05	4.02E-05		636	3.94E-08	7.96E-06	6.24E-06	4.48E-05
436	1.07E-05	4.84E-06	1.18E-04	4.32E-05		640	4.03E-08	8.31E-06	2.88E-06	4.62E-05
440	6.74E-06	5.69E-06	7.81E-05	4.57E-05		644	4.15E-08	8.47E-06	2.76E-06	4.83E-05
444	4.07E-06	6.53E-06	5.09E-05	4.69E-05		648	4.29E-08	8.96E-06	5.05E-06	5.12E-05
448	3.48E-06	7.89E-06	4.59E-05	4.88E-05		652	4.45E-08	9.55E-06	5.40E-06	5.42E-05
452	3.23E-06	8.98E-06	4.39E-05	5.06E-05		656	4.62E-08	1.00E-05	4.29E-06	5.71E-05
456	3.12E-06	9.73E-06	4.13E-05	5.26E-05		660	4.79E-08	1.05E-05	4.07E-06	5.90E-05
460	3.02E-06	9.99E-06	3.83E-05	5.42E-05		664	4.96E-08	1.06E-05	4.41E-06	5.99E-05
464	3.00E-06	1.07E-05	3.51E-05	5.48E-05		668	5.11E-08	1.06E-05	3.75E-06	5.99E-05
468	2.64E-06	1.07E-05	3.21E-05	5.46E-05		672	5.25E-08	1.03E-05	3.06E-06	5.87E-05
472	2.14E-06	1.04E-05	2.94E-05	5.35E-05		676	5.40E-08	9.93E-06	2.78E-06	5.75E-05
476	1.82E-06	9.88E-06	2.80E-05	5.21E-05		680	5.56E-08	9.79E-06	1.93E-06	5.46E-05
480	2.52E-06	9.43E-06	3.38E-05	5.12E-05		684	5.73E-08	9.41E-06	2.73E-06	5.23E-05
484	4.06E-06	8.96E-06	4.85E-05	5.00E-05		688	5.92E-08	8.54E-06	2.50E-06	4.93E-05
488	5.00E-06	8.96E-06	5.63E-05	4.89E-05		692	6.12E-08	6.97E-06	1.92E-06	4.47E-05
492	4.19E-06	8.43E-06	4.83E-05	4.73E-05		696	6.40E-08	6.61E-06	4.69E-07	4.06E-05
496	2.56E-06	7.93E-06	3.46E-05	4.48E-05		700	6.74E-08	6.41E-06	5.62E-07	3.72E-05
500	1.42E-06	7.82E-06	2.14E-05	4.18E-05		704	7.09E-08	5.72E-06	4.44E-06	3.42E-05
504	5.98E-07	6.95E-06	1.36E-05	3.95E-05		708	7.50E-08	4.73E-06	9.95E-06	3.16E-05
508	3.43E-08	6.54E-06	1.05E-05	3.74E-05		712	8.05E-08	4.22E-06	8.46E-06	2.97E-05
512	2.13E-07	5.90E-06	8.80E-06	3.56E-05		716	8.59E-08	3.04E-06	2.52E-06	2.88E-05
516	1.13E-07	5.87E-06	7.33E-06	3.40E-05		720	9.16E-08	2.40E-06	9.16E-08	2.80E-05
520	3.36E-08	5.45E-06	6.14E-06	3.25E-05		724	9.77E-08	1.79E-06	9.77E-08	2.69E-05
524	3.39E-08	5.50E-06	5.21E-06	3.16E-05		728	1.04E-07	1.78E-06	1.04E-07	2.64E-05
528	3.43E-08	5.42E-06	5.07E-06	3.11E-05		732	1.10E-07	1.26E-06	1.10E-07	2.68E-05
532	3.43E-08	5.28E-06	6.49E-06	3.07E-05		736	1.17E-07	4.07E-07	1.17E-07	2.58E-05
536	9.25E-07	5.30E-06	1.86E-05	3.10E-05		740	1.23E-07	1.16E-06	1.23E-07	2.56E-05
540	4.65E-06	5.41E-06	5.77E-05	3.15E-05		744	1.30E-07	1.10E-06	1.30E-07	2.76E-05
544	8.09E-06	5.59E-06	8.66E-05	3.24E-05		748	1.38E-07	5.61E-07	1.38E-07	2.86E-05
548	5.19E-06	6.27E-06	5.80E-05	3.35E-05		752	1.46E-07	1.46E-07	1.46E-07	2.99E-05
552	1.85E-06	6.51E-06	2.69E-05	3.45E-05		756	1.57E-07	9.20E-07	1.57E-07	3.14E-05
556	4.02E-07	6.71E-06	1.09E-05	3.48E-05		760	1.71E-07	2.83E-07	1.71E-07	3.19E-05
560	3.27E-08	6.57E-06	4.77E-06	3.50E-05		764	1.85E-07	1.85E-07	1.85E-07	3.23E-05
564	3.31E-08	6.46E-06	3.03E-06	3.57E-05		768	2.01E-07	2.01E-07	2.01E-07	3.24E-05
568	3.34E-08	6.39E-06	2.44E-06	3.67E-05		772	2.24E-07	2.24E-07	2.24E-07	2.90E-05
572	3.34E-08	6.71E-06	3.94E-06	3.81E-05		776	2.47E-07	2.47E-07	2.47E-07	2.42E-05
576	6.90E-08	7.22E-06	1.01E-05	3.99E-05		780	2.77E-07	2.77E-07	2.77E-07	2.25E-05
580	9.78E-07	7.45E-06	1.96E-05	4.20E-05						

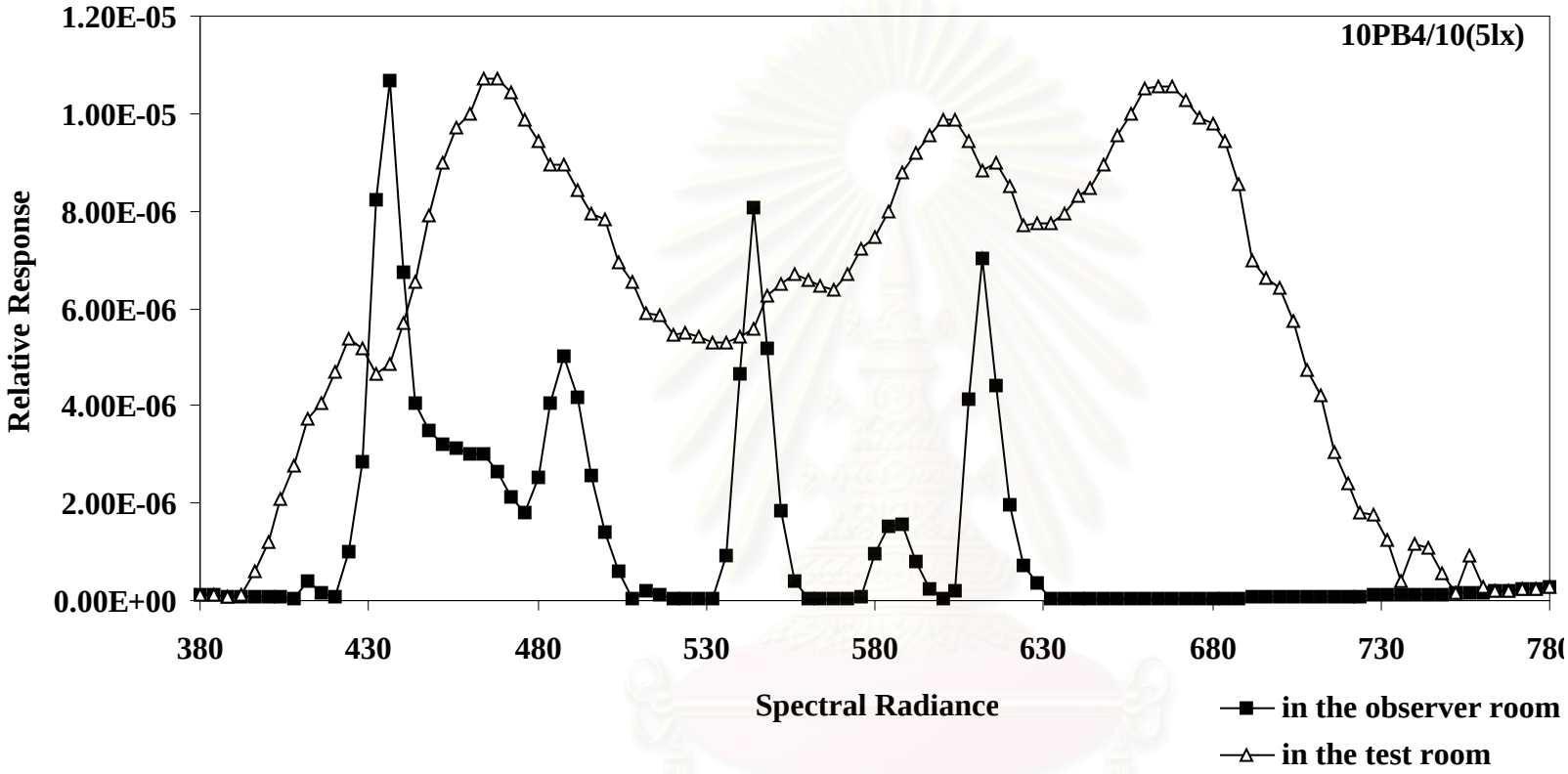


Fig.F-16a Compairison between the spatral of the color chart 10PB4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

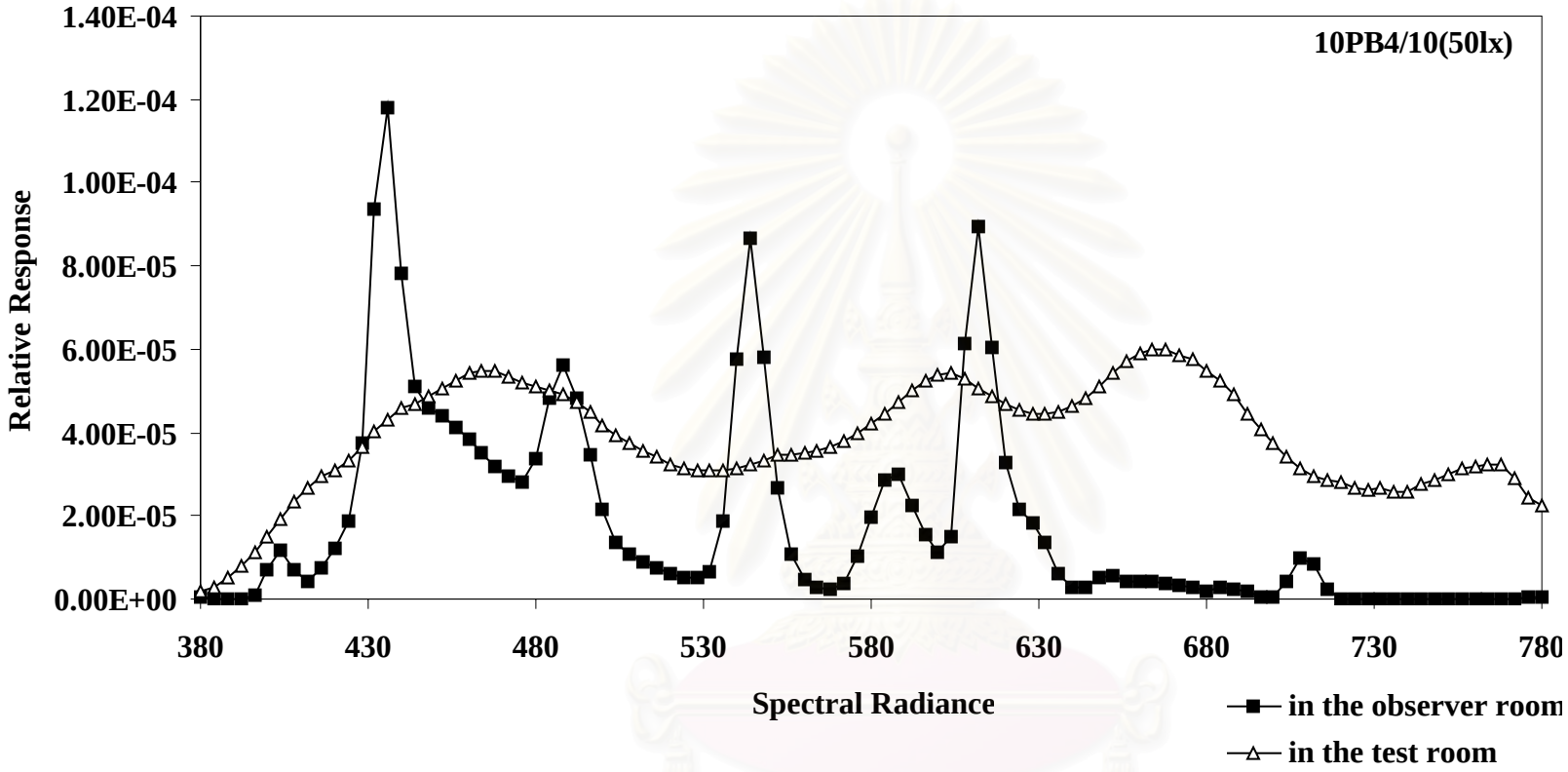


Fig.F-16b Compairison between the spatral of the color chart 10PB4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-17 The spectral distribution data of 5P4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	2.10E-06		584	2.96E-06	9.75E-06	4.09E-05	5.38E-05
384	1.09E-07	1.09E-07	1.09E-07	3.62E-06		588	3.13E-06	1.03E-05	4.12E-05	5.63E-05
388	9.16E-08	9.16E-08	9.16E-08	3.36E-06		592	2.12E-06	1.09E-05	3.16E-05	5.85E-05
392	1.50E-07	1.88E-07	7.96E-08	6.62E-06		596	8.95E-07	1.09E-05	2.21E-05	6.01E-05
396	1.42E-07	7.67E-07	8.03E-07	9.33E-06		600	2.57E-07	1.11E-05	1.64E-05	6.13E-05
400	3.29E-07	1.26E-06	6.32E-06	1.24E-05		604	7.04E-07	1.14E-05	2.18E-05	6.22E-05
404	1.24E-07	1.75E-06	1.09E-05	1.55E-05		608	7.19E-06	1.13E-05	8.26E-05	6.22E-05
408	8.45E-08	2.42E-06	7.66E-06	1.85E-05		612	1.13E-05	1.10E-05	1.21E-04	6.13E-05
412	5.67E-08	2.61E-06	5.52E-06	2.11E-05		616	7.32E-06	1.11E-05	8.32E-05	6.10E-05
416	4.54E-07	2.78E-06	6.37E-06	2.30E-05		620	3.42E-06	1.13E-05	4.66E-05	6.05E-05
420	2.97E-07	2.92E-06	1.06E-05	2.44E-05		624	2.05E-06	1.12E-05	3.24E-05	5.95E-05
424	6.37E-07	2.94E-06	1.71E-05	2.58E-05		628	1.59E-06	1.09E-05	2.82E-05	5.90E-05
428	2.72E-06	3.46E-06	3.43E-05	2.80E-05		632	5.93E-07	1.08E-05	2.14E-05	5.90E-05
432	7.90E-06	4.01E-06	8.50E-05	3.05E-05		636	3.94E-08	1.04E-05	1.07E-05	5.93E-05
436	1.01E-05	4.30E-06	1.07E-04	3.19E-05		640	4.03E-08	1.06E-05	5.39E-06	6.01E-05
440	6.24E-06	4.75E-06	6.97E-05	3.31E-05		644	4.15E-08	1.10E-05	6.05E-06	6.10E-05
444	3.61E-06	4.98E-06	4.43E-05	3.41E-05		648	4.29E-08	1.08E-05	8.02E-06	6.28E-05
448	3.03E-06	5.29E-06	3.86E-05	3.39E-05		652	4.45E-08	1.14E-05	8.46E-06	6.43E-05
452	2.87E-06	5.18E-06	3.63E-05	3.40E-05		656	4.62E-08	1.18E-05	6.47E-06	6.64E-05
456	2.53E-06	5.62E-06	3.32E-05	3.43E-05		660	4.79E-08	1.23E-05	5.82E-06	6.77E-05
460	2.02E-06	5.70E-06	2.98E-05	3.48E-05		664	4.96E-08	1.23E-05	6.55E-06	6.90E-05
464	1.54E-06	5.81E-06	2.65E-05	3.43E-05		668	5.11E-08	1.26E-05	5.76E-06	6.96E-05
468	1.24E-06	5.72E-06	2.38E-05	3.25E-05		672	5.25E-08	1.25E-05	4.76E-06	7.01E-05
472	1.41E-06	5.41E-06	2.07E-05	3.04E-05		676	5.40E-08	1.27E-05	4.00E-06	7.00E-05
476	6.50E-07	4.92E-06	1.89E-05	2.81E-05		680	5.56E-08	1.29E-05	4.86E-06	6.95E-05
480	1.02E-06	4.27E-06	2.22E-05	2.63E-05		684	5.73E-08	1.36E-05	5.44E-06	7.01E-05
484	2.36E-06	4.07E-06	3.11E-05	2.50E-05		688	5.92E-08	1.36E-05	5.84E-06	6.84E-05
488	2.56E-06	3.50E-06	3.53E-05	2.37E-05		692	6.12E-08	1.34E-05	4.76E-06	6.65E-05
492	2.03E-06	2.90E-06	2.97E-05	2.22E-05		696	6.40E-08	1.29E-05	2.24E-06	6.55E-05
496	8.98E-07	2.78E-06	2.10E-05	2.04E-05		700	6.74E-08	1.30E-05	3.09E-06	6.42E-05
500	2.75E-07	2.95E-06	1.27E-05	1.91E-05		704	7.09E-08	1.24E-05	1.33E-05	6.25E-05
504	3.48E-08	2.58E-06	8.22E-06	1.82E-05		708	7.50E-08	1.15E-05	2.44E-05	6.08E-05
508	3.43E-08	2.70E-06	6.08E-06	1.73E-05		712	8.05E-08	1.11E-05	2.02E-05	5.96E-05
512	3.38E-08	2.13E-06	5.20E-06	1.64E-05		716	8.59E-08	1.05E-05	7.28E-06	5.87E-05
516	3.37E-08	1.90E-06	4.28E-06	1.58E-05		720	9.16E-08	1.01E-05	6.57E-07	5.72E-05
520	3.36E-08	1.92E-06	3.28E-06	1.52E-05		724	9.77E-08	9.31E-06	9.77E-08	5.51E-05
524	3.39E-08	1.99E-06	2.78E-06	1.44E-05		728	1.04E-07	7.66E-06	1.04E-07	5.25E-05
528	3.43E-08	1.84E-06	2.73E-06	1.41E-05		732	1.10E-07	6.79E-06	1.10E-07	5.10E-05
532	3.43E-08	1.97E-06	4.05E-06	1.47E-05		736	1.17E-07	6.30E-06	1.17E-07	5.02E-05
536	3.60E-07	1.93E-06	1.29E-05	1.58E-05		740	1.23E-07	6.08E-06	1.23E-07	4.82E-05
540	3.26E-06	2.02E-06	4.03E-05	1.74E-05		744	1.30E-07	6.33E-06	1.30E-07	4.66E-05
544	5.39E-06	3.25E-06	6.24E-05	2.02E-05		748	1.38E-07	4.62E-06	1.38E-07	4.46E-05
548	3.81E-06	3.98E-06	4.56E-05	2.34E-05		752	1.46E-07	4.08E-06	1.46E-07	4.22E-05
552	1.47E-06	4.81E-06	2.52E-05	2.69E-05		756	1.57E-07	2.40E-06	1.57E-07	4.06E-05
556	3.06E-07	5.78E-06	1.40E-05	3.08E-05		760	1.71E-07	1.07E-06	1.71E-07	3.71E-05
560	3.27E-08	6.54E-06	9.46E-06	3.47E-05		764	1.85E-07	2.88E-07	1.85E-07	3.47E-05
564	3.31E-08	7.21E-06	8.43E-06	3.83E-05		768	2.01E-07	2.45E-07	2.01E-07	3.14E-05
568	3.34E-08	8.10E-06	7.82E-06	4.20E-05		772	2.24E-07	2.24E-07	2.24E-07	2.57E-05
572	3.34E-08	8.49E-06	9.78E-06	4.55E-05		776	2.47E-07	2.47E-07	2.47E-07	2.41E-05
576	2.66E-07	8.87E-06	1.77E-05	4.88E-05		780	2.77E-07	2.77E-07	2.77E-07	2.03E-05
580	1.50E-06	9.28E-06	2.97E-05	5.15E-05						

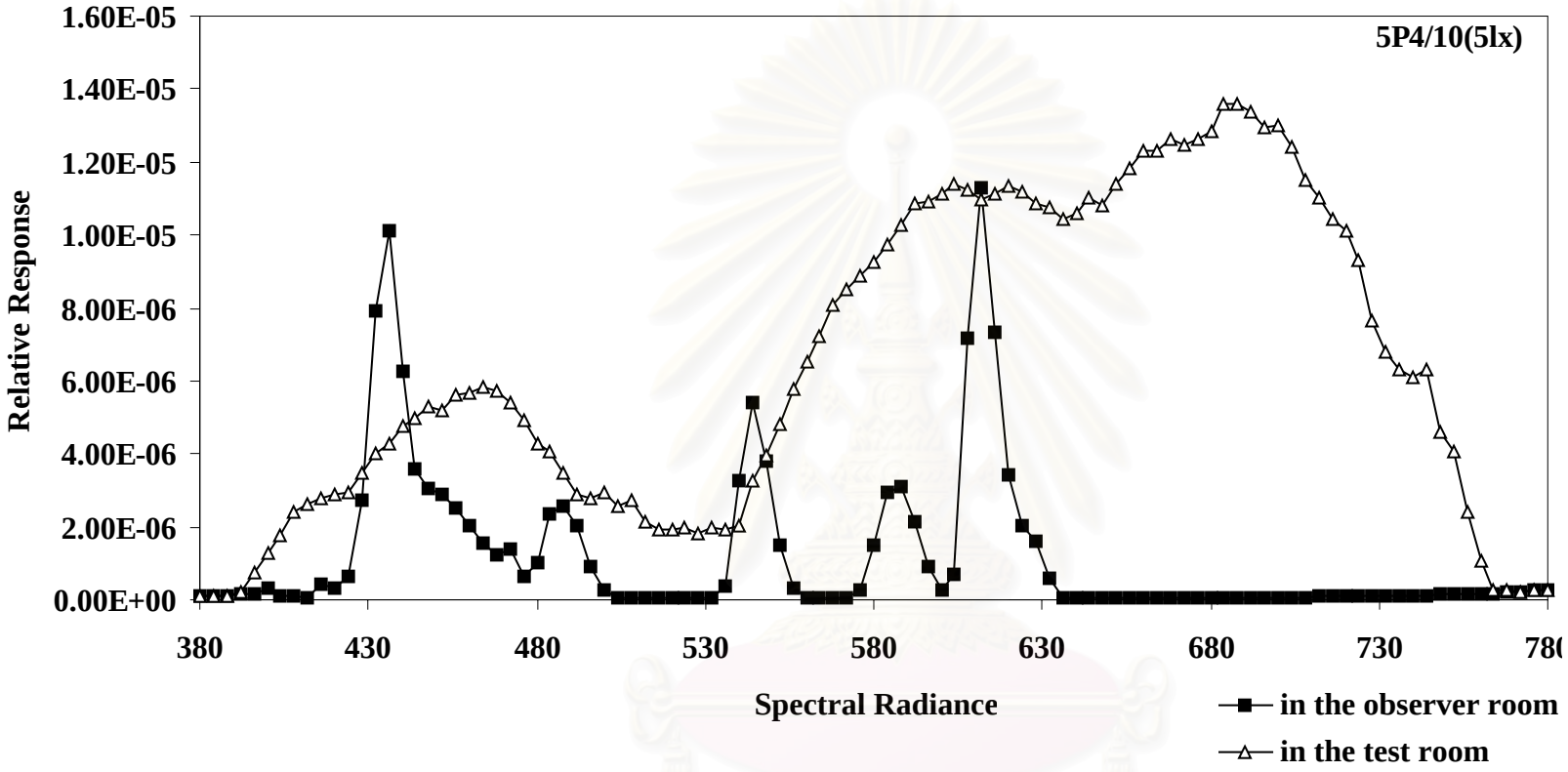


Fig.F-17a Compairison between the spatral of the color chart 5P4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

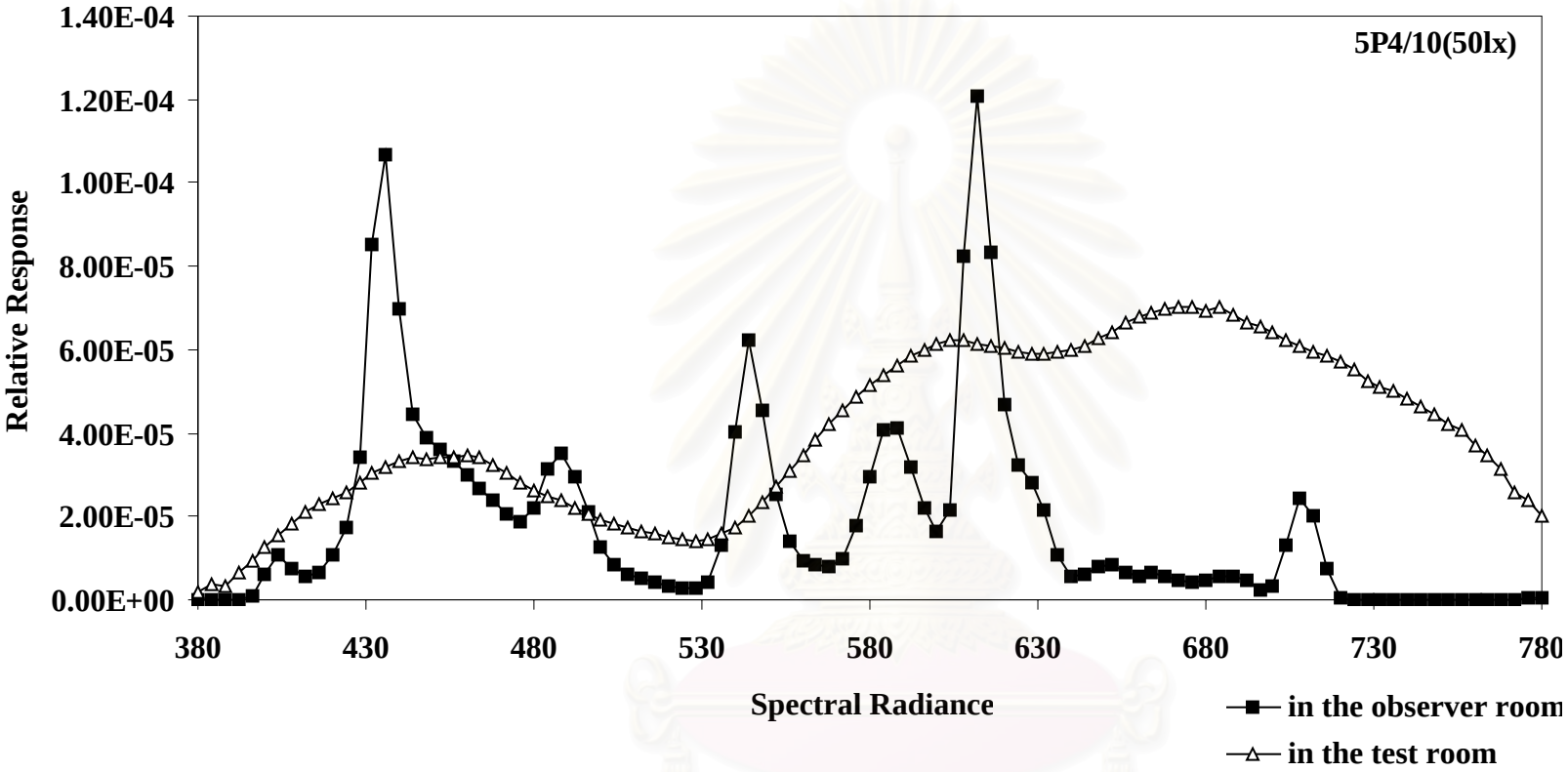


Fig.F-17b Compairison between the spatral of the color chart 5P4/10 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-18 The spectral distribution data of 10P4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.98E-06		584	3.20E-06	1.04E-05	4.18E-05	5.98E-05
384	1.49E-06	1.09E-07	1.86E-07	1.61E-06		588	3.48E-06	1.19E-05	4.45E-05	6.75E-05
388	3.83E-07	9.16E-08	1.08E-07	2.17E-06		592	2.58E-06	1.32E-05	3.58E-05	7.44E-05
392	8.93E-08	1.09E-07	1.23E-07	5.68E-06		596	1.59E-06	1.41E-05	2.61E-05	8.05E-05
396	2.11E-07	6.31E-07	1.33E-06	8.53E-06		600	6.69E-07	1.49E-05	2.01E-05	8.50E-05
400	2.61E-07	8.84E-07	5.72E-06	1.15E-05		604	1.42E-06	1.56E-05	2.80E-05	8.77E-05
404	3.13E-07	8.39E-07	9.28E-06	1.36E-05		608	1.02E-05	1.59E-05	1.09E-04	8.84E-05
408	1.22E-07	1.35E-06	6.12E-06	1.58E-05		612	1.58E-05	1.54E-05	1.60E-04	8.71E-05
412	9.42E-08	1.42E-06	4.12E-06	1.77E-05		616	1.05E-05	1.56E-05	1.09E-04	8.61E-05
416	5.58E-08	1.35E-06	6.10E-06	1.95E-05		620	5.01E-06	1.55E-05	6.05E-05	8.47E-05
420	2.64E-07	2.31E-06	8.78E-06	2.05E-05		624	2.85E-06	1.51E-05	4.15E-05	8.27E-05
424	7.29E-07	2.40E-06	1.37E-05	2.17E-05		628	2.30E-06	1.50E-05	3.52E-05	8.15E-05
428	2.16E-06	2.52E-06	2.78E-05	2.32E-05		632	1.24E-06	1.47E-05	2.63E-05	8.10E-05
432	6.04E-06	3.01E-06	6.82E-05	2.50E-05		636	2.59E-07	1.48E-05	1.31E-05	8.14E-05
436	7.49E-06	3.00E-06	8.52E-05	2.68E-05		640	4.03E-08	1.51E-05	6.81E-06	8.22E-05
440	4.68E-06	2.92E-06	5.59E-05	2.80E-05		644	4.15E-08	1.52E-05	7.48E-06	8.39E-05
444	2.90E-06	3.47E-06	3.56E-05	2.79E-05		648	4.29E-08	1.56E-05	9.84E-06	8.69E-05
448	1.97E-06	3.63E-06	3.12E-05	2.79E-05		652	4.45E-08	1.62E-05	1.04E-05	8.96E-05
452	2.32E-06	3.95E-06	2.90E-05	2.87E-05		656	4.62E-08	1.69E-05	7.90E-06	9.22E-05
456	2.10E-06	4.44E-06	2.65E-05	2.88E-05		660	4.79E-08	1.68E-05	7.68E-06	9.36E-05
460	1.46E-06	5.02E-06	2.39E-05	2.85E-05		664	4.96E-08	1.68E-05	8.23E-06	9.43E-05
464	1.19E-06	4.98E-06	2.15E-05	2.77E-05		668	5.11E-08	1.71E-05	7.20E-06	9.38E-05
468	1.27E-06	3.94E-06	1.89E-05	2.66E-05		672	5.25E-08	1.67E-05	5.95E-06	9.21E-05
472	1.11E-06	3.86E-06	1.65E-05	2.48E-05		676	5.40E-08	1.64E-05	5.91E-06	8.91E-05
476	4.11E-07	3.45E-06	1.50E-05	2.32E-05		680	5.56E-08	1.58E-05	5.55E-06	8.61E-05
480	9.02E-07	2.76E-06	1.78E-05	2.16E-05		684	5.73E-08	1.56E-05	5.69E-06	8.29E-05
484	1.62E-06	2.72E-06	2.49E-05	2.02E-05		688	5.92E-08	1.49E-05	6.06E-06	7.90E-05
488	2.03E-06	2.88E-06	2.84E-05	1.93E-05		692	6.12E-08	1.35E-05	4.85E-06	7.41E-05
492	1.73E-06	2.41E-06	2.42E-05	1.87E-05		696	6.40E-08	1.31E-05	2.42E-06	6.87E-05
496	7.51E-07	2.70E-06	1.72E-05	1.69E-05		700	6.74E-08	1.28E-05	2.99E-06	6.51E-05
500	2.75E-07	1.89E-06	1.04E-05	1.46E-05		704	7.09E-08	1.17E-05	1.20E-05	6.12E-05
504	4.51E-08	1.73E-06	6.86E-06	1.39E-05		708	7.50E-08	9.89E-06	2.19E-05	5.69E-05
508	5.33E-08	1.55E-06	5.12E-06	1.36E-05		712	8.05E-08	9.52E-06	1.81E-05	5.50E-05
512	3.38E-08	1.48E-06	4.15E-06	1.34E-05		716	8.59E-08	8.40E-06	7.15E-06	5.16E-05
516	3.37E-08	1.23E-06	3.55E-06	1.33E-05		720	9.16E-08	7.49E-06	1.08E-06	4.99E-05
520	3.36E-08	1.28E-06	3.01E-06	1.27E-05		724	9.77E-08	6.98E-06	9.77E-08	4.93E-05
524	3.39E-08	1.59E-06	2.77E-06	1.17E-05		728	1.04E-07	5.03E-06	1.04E-07	4.74E-05
528	3.43E-08	9.70E-07	2.23E-06	1.16E-05		732	1.10E-07	5.26E-06	1.10E-07	4.45E-05
532	3.43E-08	9.11E-07	3.04E-06	1.20E-05		736	1.17E-07	5.53E-06	1.17E-07	4.36E-05
536	2.30E-07	9.23E-07	1.04E-05	1.24E-05		740	1.23E-07	2.81E-06	1.23E-07	4.22E-05
540	2.26E-06	1.34E-06	3.39E-05	1.34E-05		744	1.30E-07	3.22E-06	1.30E-07	4.07E-05
544	4.60E-06	1.66E-06	5.22E-05	1.54E-05		748	1.38E-07	2.83E-06	1.38E-07	3.91E-05
548	3.30E-06	2.35E-06	3.69E-05	1.79E-05		752	1.46E-07	1.98E-06	1.46E-07	3.91E-05
552	1.34E-06	2.78E-06	1.91E-05	2.05E-05		756	1.57E-07	1.05E-06	1.57E-07	3.87E-05
556	3.06E-07	3.60E-06	9.29E-06	2.34E-05		760	1.71E-07	1.71E-07	1.71E-07	3.60E-05
560	3.27E-08	3.99E-06	5.37E-06	2.66E-05		764	1.85E-07	1.85E-07	1.85E-07	3.39E-05
564	3.31E-08	4.51E-06	3.97E-06	3.00E-05		768	2.01E-07	2.01E-07	2.01E-07	3.13E-05
568	3.34E-08	5.54E-06	4.36E-06	3.46E-05		772	2.24E-07	2.24E-07	2.24E-07	2.61E-05
572	3.34E-08	6.39E-06	6.77E-06	4.00E-05		776	2.47E-07	2.47E-07	2.47E-07	2.42E-05
576	3.20E-07	7.66E-06	1.45E-05	4.62E-05		780	2.77E-07	2.77E-07	2.77E-07	2.37E-05
580	1.72E-06	8.71E-06	2.80E-05	5.29E-05						

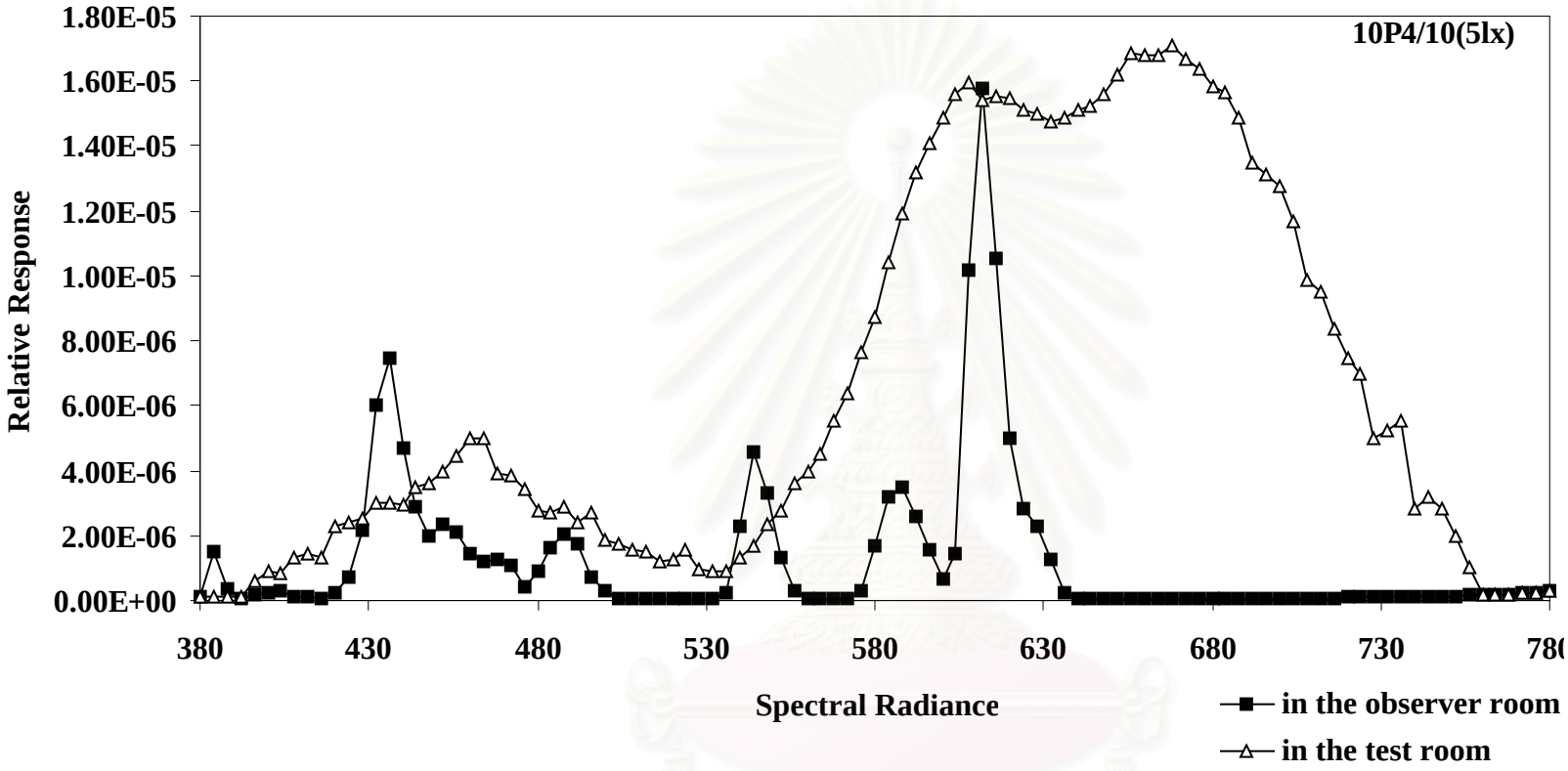


Fig.F-18a Compairison between the spatral of the color chart 10P4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

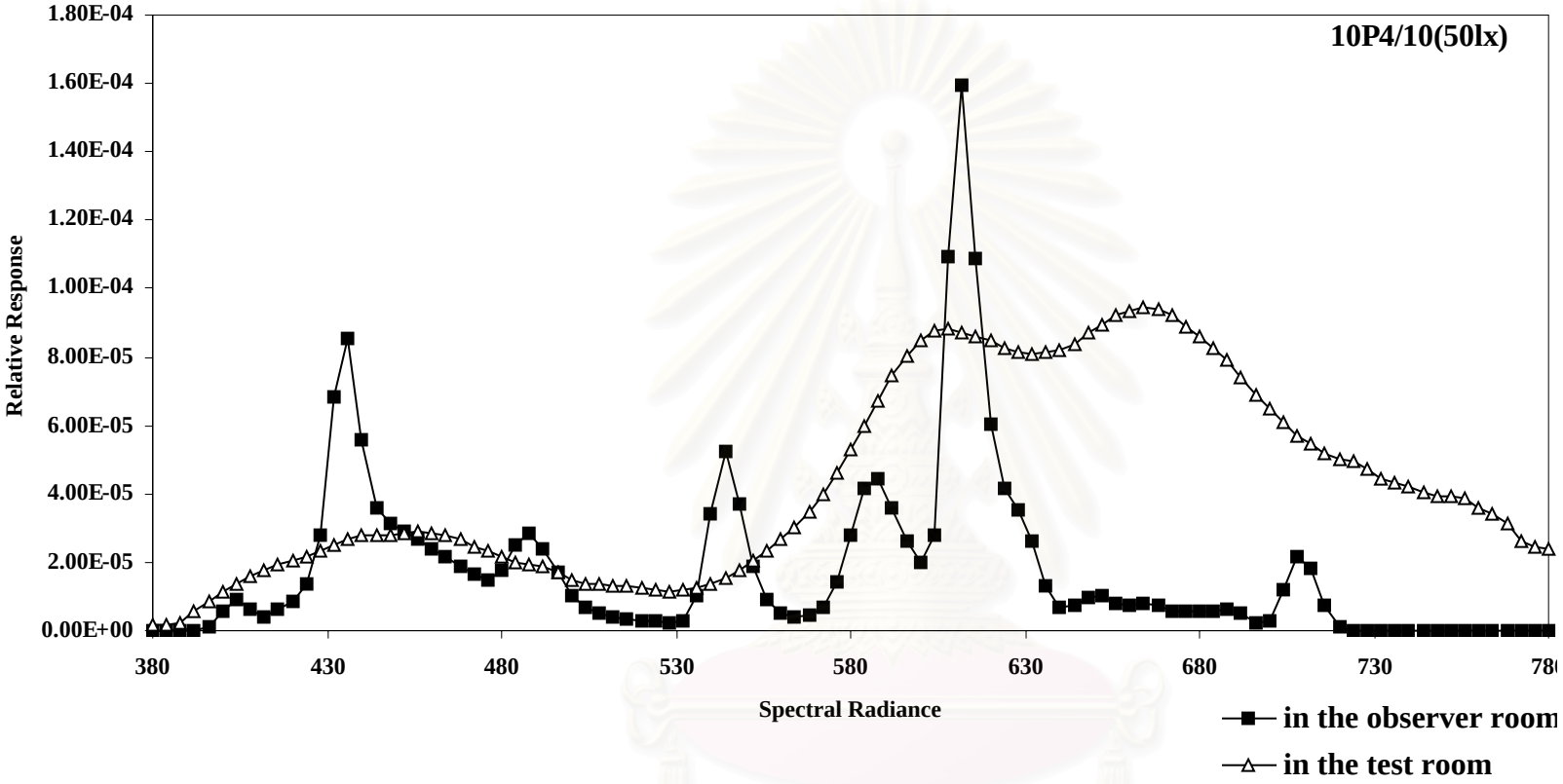


Fig.F-18b Compairison between the spatral of the color chart 10P4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-19 The spectral distribution data of 5RP4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.29E-06		584	3.12E-06	8.19E-06	4.12E-05	4.85E-05
384	1.09E-07	1.09E-07	5.70E-07	1.49E-06		588	3.59E-06	1.06E-05	4.64E-05	6.04E-05
388	9.16E-08	9.16E-08	9.43E-07	2.56E-06		592	2.54E-06	1.33E-05	3.88E-05	7.18E-05
392	7.96E-08	1.09E-07	8.38E-07	4.31E-06		596	1.64E-06	1.52E-05	2.89E-05	8.23E-05
396	7.47E-08	5.64E-07	7.23E-07	6.15E-06		600	1.46E-06	1.72E-05	2.32E-05	9.14E-05
400	6.86E-08	5.41E-07	4.21E-06	7.47E-06		604	2.44E-06	1.84E-05	3.43E-05	9.84E-05
404	6.21E-08	6.07E-07	6.76E-06	8.53E-06		608	1.32E-05	1.95E-05	1.43E-04	1.02E-04
408	5.81E-08	1.29E-06	4.32E-06	9.71E-06		612	2.07E-05	1.92E-05	2.10E-04	1.03E-04
412	5.67E-08	1.76E-06	2.38E-06	1.03E-05		616	1.42E-05	1.97E-05	1.44E-04	1.03E-04
416	5.58E-08	9.69E-07	3.86E-06	1.08E-05		620	7.06E-06	2.02E-05	8.13E-05	1.03E-04
420	5.33E-08	6.64E-07	5.65E-06	1.13E-05		624	4.30E-06	1.95E-05	5.60E-05	1.02E-04
424	1.09E-07	1.04E-06	9.07E-06	1.25E-05		628	3.15E-06	1.92E-05	4.74E-05	1.00E-04
428	1.04E-06	1.07E-06	1.86E-05	1.33E-05		632	1.67E-06	1.91E-05	3.53E-05	9.93E-05
432	3.88E-06	1.38E-06	4.63E-05	1.43E-05		636	4.92E-07	1.88E-05	1.74E-05	9.85E-05
436	5.08E-06	1.56E-06	5.82E-05	1.53E-05		640	4.03E-08	1.85E-05	8.96E-06	9.83E-05
440	2.75E-06	1.23E-06	3.85E-05	1.57E-05		644	4.15E-08	1.85E-05	9.25E-06	9.86E-05
444	1.77E-06	1.39E-06	2.44E-05	1.62E-05		648	4.29E-08	1.89E-05	1.32E-05	9.95E-05
448	1.31E-06	1.95E-06	2.13E-05	1.67E-05		652	4.45E-08	1.91E-05	1.40E-05	1.01E-04
452	1.41E-06	2.44E-06	2.07E-05	1.75E-05		656	4.62E-08	1.89E-05	1.03E-05	1.01E-04
456	8.76E-07	2.47E-06	1.96E-05	1.80E-05		660	4.79E-08	1.89E-05	9.25E-06	9.99E-05
460	9.63E-07	2.52E-06	1.78E-05	1.81E-05		664	4.96E-08	1.82E-05	1.02E-05	9.88E-05
464	6.06E-07	2.63E-06	1.62E-05	1.78E-05		668	5.11E-08	1.80E-05	8.56E-06	9.64E-05
468	4.98E-07	2.33E-06	1.48E-05	1.76E-05		672	5.25E-08	1.77E-05	7.21E-06	9.32E-05
472	7.96E-07	2.41E-06	1.33E-05	1.70E-05		676	5.40E-08	1.71E-05	6.58E-06	9.04E-05
476	3.77E-07	2.45E-06	1.20E-05	1.60E-05		680	5.56E-08	1.71E-05	6.46E-06	8.61E-05
480	5.44E-07	2.25E-06	1.47E-05	1.57E-05		684	5.73E-08	1.62E-05	6.75E-06	8.23E-05
484	1.29E-06	2.08E-06	2.15E-05	1.53E-05		688	5.92E-08	1.54E-05	7.17E-06	7.87E-05
488	1.76E-06	1.83E-06	2.52E-05	1.52E-05		692	6.12E-08	1.52E-05	5.83E-06	7.39E-05
492	1.41E-06	1.78E-06	2.21E-05	1.47E-05		696	6.40E-08	1.39E-05	2.70E-06	6.90E-05
496	3.59E-07	1.60E-06	1.59E-05	1.36E-05		700	6.74E-08	1.34E-05	3.22E-06	6.63E-05
500	3.54E-08	1.52E-06	9.57E-06	1.33E-05		704	7.09E-08	1.21E-05	1.28E-05	6.24E-05
504	3.48E-08	1.52E-06	6.16E-06	1.26E-05		708	7.50E-08	1.06E-05	2.54E-05	5.89E-05
508	3.43E-08	1.19E-06	4.72E-06	1.17E-05		712	8.05E-08	9.49E-06	2.02E-05	5.47E-05
512	3.38E-08	1.25E-06	4.18E-06	1.08E-05		716	8.59E-08	9.13E-06	7.15E-06	5.24E-05
516	3.37E-08	9.23E-07	3.56E-06	1.09E-05		720	9.16E-08	7.34E-06	7.27E-07	4.96E-05
520	3.36E-08	6.02E-07	2.70E-06	1.07E-05		724	9.77E-08	7.45E-06	9.77E-08	4.69E-05
524	3.39E-08	7.66E-07	2.36E-06	1.03E-05		728	1.04E-07	5.60E-06	1.04E-07	4.33E-05
528	3.43E-08	1.14E-06	2.40E-06	1.03E-05		732	1.10E-07	4.55E-06	1.10E-07	4.13E-05
532	3.43E-08	8.96E-07	3.32E-06	1.06E-05		736	1.17E-07	3.43E-06	1.17E-07	3.85E-05
536	2.30E-07	5.49E-07	9.80E-06	1.06E-05		740	1.23E-07	2.60E-06	1.23E-07	3.54E-05
540	2.45E-06	1.02E-06	3.16E-05	1.08E-05		744	1.30E-07	1.76E-06	1.30E-07	3.28E-05
544	3.93E-06	1.42E-06	4.81E-05	1.14E-05		748	1.38E-07	5.61E-07	1.38E-07	3.10E-05
548	2.35E-06	1.21E-06	3.30E-05	1.25E-05		752	1.46E-07	1.46E-07	1.46E-07	2.69E-05
552	6.66E-07	1.56E-06	1.60E-05	1.34E-05		756	1.57E-07	1.57E-07	1.57E-07	2.45E-05
556	3.22E-08	1.91E-06	6.94E-06	1.41E-05		760	1.71E-07	1.71E-07	1.71E-07	2.20E-05
560	3.27E-08	1.90E-06	3.50E-06	1.53E-05		764	1.85E-07	1.85E-07	1.85E-07	2.01E-05
564	3.31E-08	2.33E-06	3.13E-06	1.67E-05		768	2.01E-07	2.01E-07	2.01E-07	1.74E-05
568	3.34E-08	2.88E-06	2.89E-06	1.98E-05		772	2.24E-07	2.24E-07	2.24E-07	1.35E-05
572	3.34E-08	3.55E-06	4.80E-06	2.45E-05		776	2.47E-07	2.47E-07	2.47E-07	1.06E-05
576	3.20E-07	4.93E-06	1.23E-05	3.06E-05		780	2.77E-07	2.77E-07	2.77E-07	8.80E-06
580	1.72E-06	6.15E-06	2.57E-05	3.87E-05						

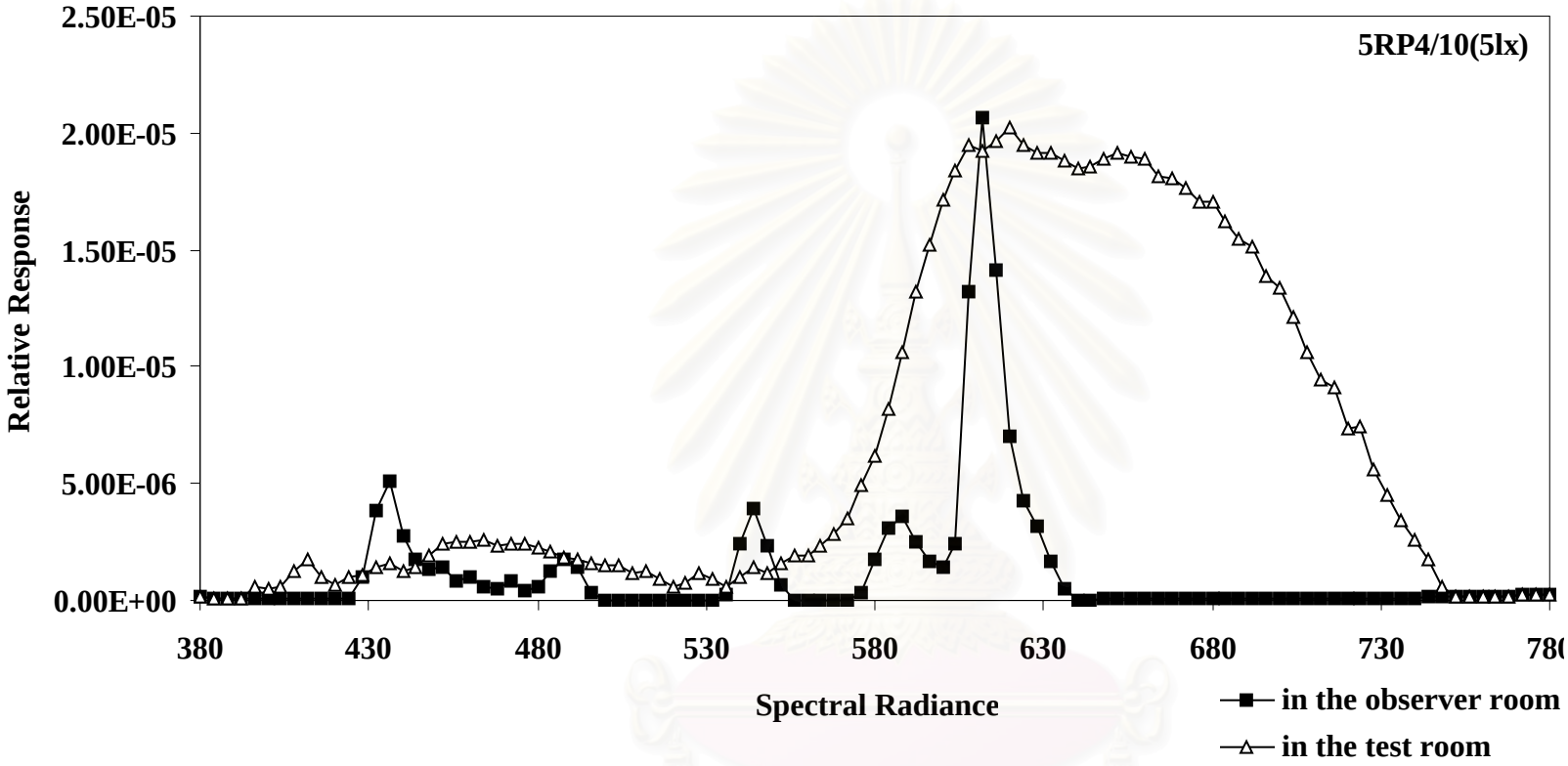


Fig.F-19a Compairison between the spatral of the color chart 5RP4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

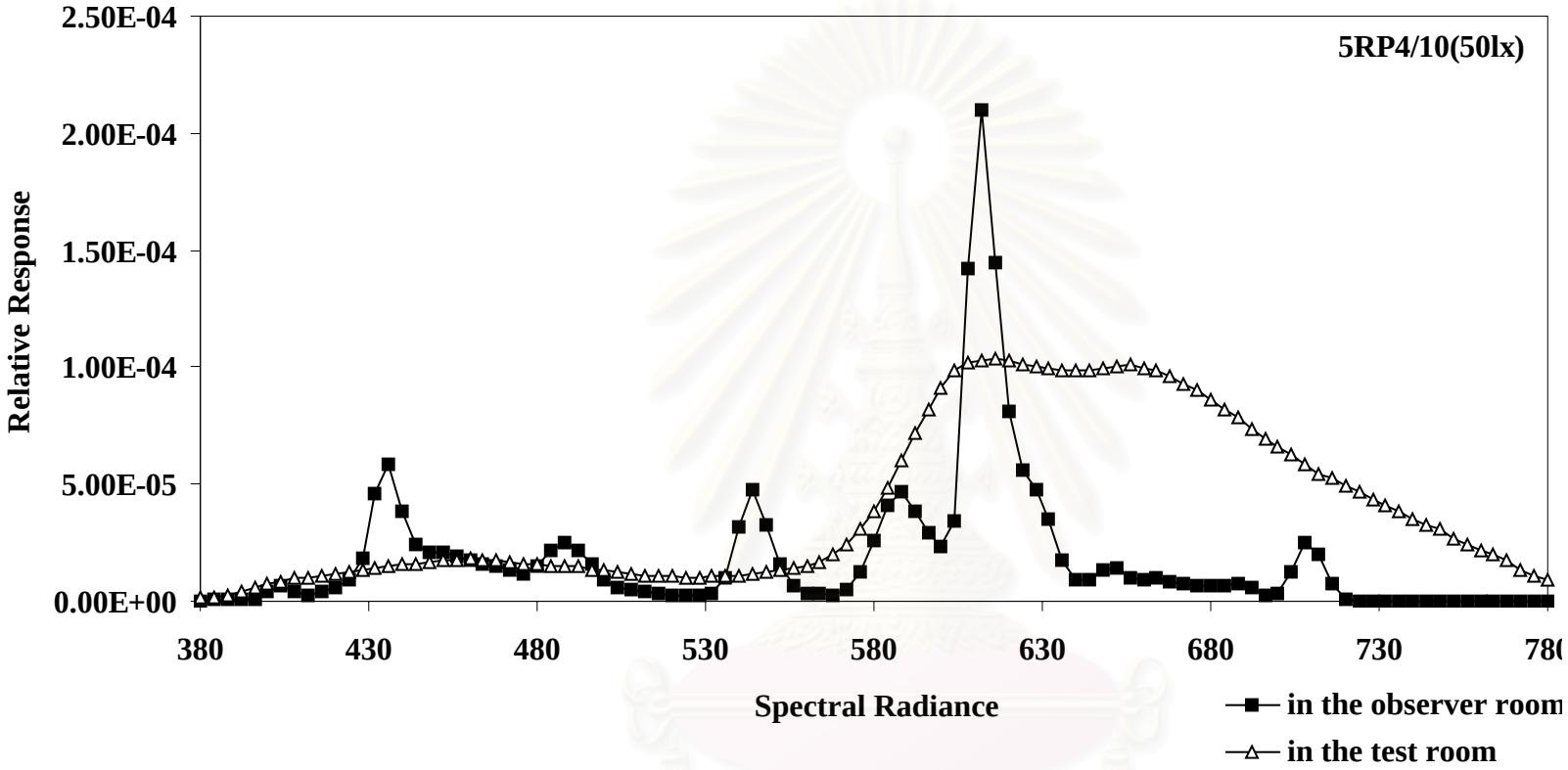


Fig.F-19b Compairison between the spatral of the color chart 5RP4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-20 The spectral distribution data of 10RP4/10 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	3.21E-07	3.68E-07		584	2.54E-06	7.52E-06	3.95E-05	4.31E-05
384	1.09E-07	1.09E-07	2.18E-07	1.20E-06		588	3.23E-06	1.03E-05	4.58E-05	5.44E-05
388	9.16E-08	9.16E-08	1.08E-07	2.11E-06		592	2.72E-06	1.28E-05	3.86E-05	6.60E-05
392	7.96E-08	7.96E-08	7.96E-08	3.14E-06		596	1.32E-06	1.48E-05	2.91E-05	7.67E-05
396	7.47E-08	7.47E-08	2.64E-07	3.44E-06		600	8.51E-07	1.70E-05	2.33E-05	8.61E-05
400	6.86E-08	6.86E-08	2.13E-06	3.85E-06		604	2.16E-06	1.90E-05	3.69E-05	9.36E-05
404	6.21E-08	1.15E-07	4.20E-06	4.41E-06		608	1.47E-05	1.98E-05	1.57E-04	9.86E-05
408	5.81E-08	1.43E-07	3.10E-06	4.93E-06		612	2.30E-05	2.06E-05	2.33E-04	1.01E-04
412	5.67E-08	7.55E-08	2.08E-06	5.73E-06		616	1.56E-05	2.15E-05	1.62E-04	1.03E-04
416	5.58E-08	5.58E-08	1.85E-06	6.74E-06		620	8.14E-06	2.16E-05	9.13E-05	1.03E-04
420	1.47E-07	5.33E-08	3.66E-06	6.67E-06		624	5.32E-06	2.17E-05	6.37E-05	1.02E-04
424	1.01E-07	6.71E-08	6.01E-06	6.55E-06		628	3.92E-06	2.15E-05	5.37E-05	1.01E-04
428	6.34E-07	1.16E-07	1.21E-05	6.77E-06		632	2.09E-06	2.07E-05	4.00E-05	9.97E-05
432	2.20E-06	6.66E-08	3.02E-05	7.21E-06		636	2.44E-07	2.04E-05	1.92E-05	9.82E-05
436	3.00E-06	6.65E-08	3.79E-05	8.42E-06		640	4.03E-08	2.01E-05	9.41E-06	9.72E-05
440	1.47E-06	4.47E-07	2.51E-05	8.90E-06		644	4.15E-08	1.91E-05	1.00E-05	9.56E-05
444	7.69E-07	1.51E-07	1.64E-05	8.66E-06		648	4.29E-08	1.88E-05	1.44E-05	9.58E-05
448	9.13E-07	3.47E-07	1.48E-05	8.84E-06		652	4.45E-08	1.91E-05	1.47E-05	9.51E-05
452	4.24E-07	7.54E-07	1.41E-05	9.52E-06		656	4.62E-08	1.87E-05	9.92E-06	9.41E-05
456	3.23E-07	8.87E-07	1.31E-05	1.03E-05		660	4.79E-08	1.82E-05	9.55E-06	9.17E-05
460	1.88E-07	8.77E-07	1.21E-05	1.07E-05		664	4.96E-08	1.78E-05	9.85E-06	8.90E-05
464	1.37E-07	1.25E-06	1.15E-05	1.07E-05		668	5.11E-08	1.74E-05	8.19E-06	8.63E-05
468	7.87E-08	1.08E-06	1.03E-05	1.06E-05		672	5.25E-08	1.68E-05	6.93E-06	8.33E-05
472	1.08E-07	1.18E-06	9.47E-06	1.02E-05		676	5.40E-08	1.61E-05	6.40E-06	8.04E-05
476	1.93E-07	6.13E-07	9.01E-06	1.01E-05		680	5.56E-08	1.60E-05	6.41E-06	7.61E-05
480	1.89E-07	4.35E-07	1.18E-05	1.02E-05		684	5.73E-08	1.55E-05	6.47E-06	7.29E-05
484	9.03E-07	5.20E-07	1.79E-05	1.01E-05		688	5.92E-08	1.41E-05	7.48E-06	6.93E-05
488	1.28E-06	1.17E-06	2.15E-05	1.01E-05		692	6.12E-08	1.34E-05	6.75E-06	6.57E-05
492	1.01E-06	1.22E-06	1.90E-05	1.01E-05		696	6.40E-08	1.33E-05	3.09E-06	6.19E-05
496	6.78E-07	1.08E-06	1.35E-05	9.76E-06		700	6.74E-08	1.19E-05	3.80E-06	5.88E-05
500	6.54E-08	8.52E-07	8.40E-06	9.43E-06		704	7.09E-08	1.14E-05	1.40E-05	5.60E-05
504	3.48E-08	7.23E-07	5.45E-06	9.08E-06		708	7.50E-08	1.09E-05	2.64E-05	5.28E-05
508	3.43E-08	6.90E-07	4.22E-06	8.98E-06		712	8.05E-08	9.35E-06	2.14E-05	4.95E-05
512	3.38E-08	5.73E-07	3.51E-06	8.75E-06		716	8.59E-08	8.66E-06	7.27E-06	4.75E-05
516	3.37E-08	5.65E-07	3.03E-06	8.88E-06		720	9.16E-08	8.34E-06	6.92E-07	4.43E-05
520	3.36E-08	6.81E-07	2.62E-06	8.88E-06		724	9.77E-08	6.61E-06	9.77E-08	4.08E-05
524	3.39E-08	5.55E-07	2.29E-06	8.68E-06		728	1.04E-07	4.93E-06	1.04E-07	3.67E-05
528	3.43E-08	6.28E-07	2.26E-06	8.41E-06		732	1.10E-07	3.52E-06	1.10E-07	3.57E-05
532	3.43E-08	6.85E-07	2.88E-06	8.41E-06		736	1.17E-07	2.67E-06	1.17E-07	3.33E-05
536	3.40E-08	6.69E-07	9.26E-06	8.70E-06		740	1.23E-07	1.95E-06	1.23E-07	2.95E-05
540	1.73E-06	5.53E-07	3.00E-05	8.69E-06		744	1.30E-07	4.13E-07	1.30E-07	2.57E-05
544	3.18E-06	7.91E-07	4.62E-05	8.39E-06		748	1.38E-07	1.38E-07	1.38E-07	2.21E-05
548	2.15E-06	7.95E-07	3.08E-05	8.62E-06		752	1.46E-07	1.46E-07	1.46E-07	2.04E-05
552	5.73E-07	9.46E-07	1.39E-05	8.97E-06		756	1.57E-07	1.57E-07	1.57E-07	1.75E-05
556	3.22E-08	7.29E-07	5.23E-06	9.73E-06		760	1.71E-07	1.71E-07	1.71E-07	1.58E-05
560	3.27E-08	8.76E-07	2.18E-06	1.11E-05		764	1.85E-07	1.85E-07	1.85E-07	1.36E-05
564	3.31E-08	1.31E-06	1.19E-06	1.27E-05		768	2.01E-07	2.01E-07	2.01E-07	1.32E-05
568	3.34E-08	2.28E-06	8.59E-07	1.59E-05		772	2.24E-07	2.24E-07	2.24E-07	7.29E-06
572	3.34E-08	3.08E-06	2.91E-06	2.01E-05		776	2.47E-07	2.47E-07	2.47E-07	4.08E-06
576	3.31E-08	4.30E-06	1.01E-05	2.61E-05		780	2.77E-07	2.77E-07	2.77E-07	1.50E-06
580	1.01E-06	5.85E-06	2.35E-05	3.38E-05						

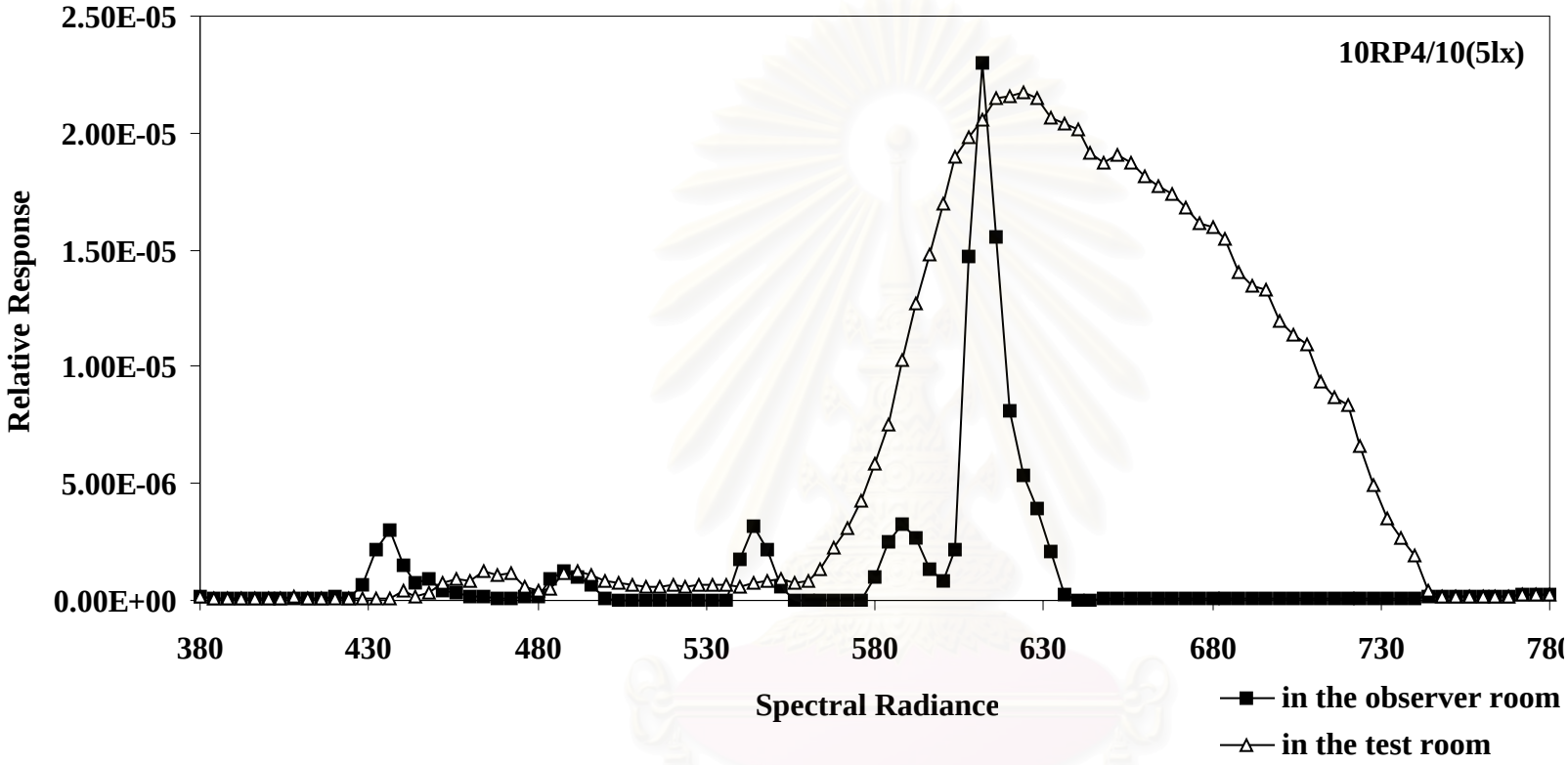


Fig.F-20a Compairison between the spatral of the color chart 10RP4/10 measured at the border of RVSI in the test room and at 5 lux in the observer room

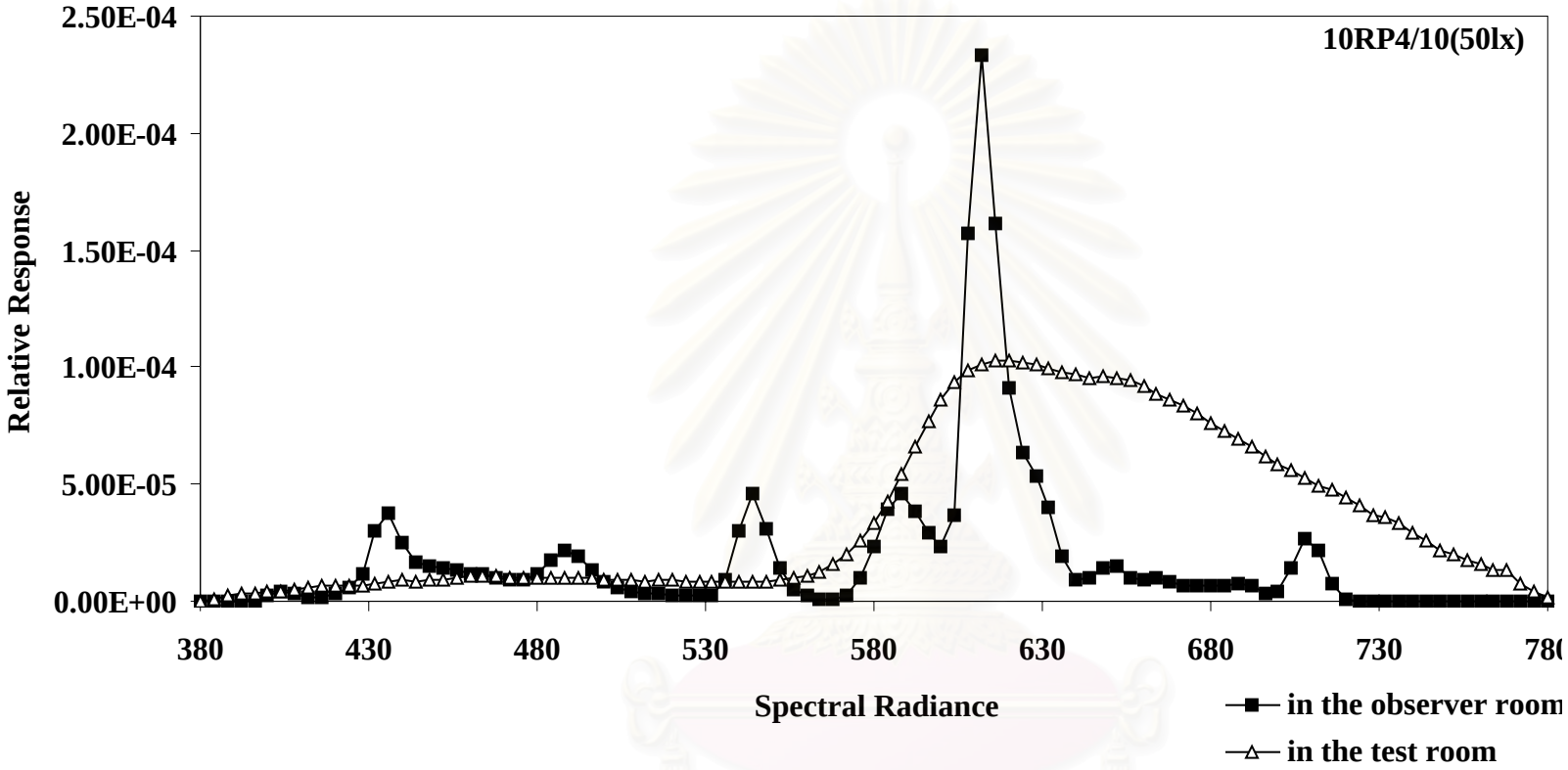


Fig.F-20b Compairison between the spatral of the color chart 10RP4/10 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-21 The spectral distribution data of 10RP3/8 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	7.59E-07		584	1.06E-06	6.73E-06	2.39E-05	3.24E-05
384	1.09E-07	1.09E-07	1.09E-07	9.04E-07		588	1.54E-06	9.38E-06	2.75E-05	4.17E-05
388	9.16E-08	9.16E-08	9.16E-08	2.01E-06		592	1.13E-06	1.16E-05	2.28E-05	5.10E-05
392	7.96E-08	7.96E-08	1.09E-07	2.03E-06		596	3.33E-07	1.37E-05	1.69E-05	6.01E-05
396	7.47E-08	7.47E-08	6.04E-07	2.67E-06		600	3.48E-08	1.58E-05	1.35E-05	6.80E-05
400	6.86E-08	6.86E-08	1.60E-06	3.60E-06		604	1.19E-06	1.78E-05	2.13E-05	7.46E-05
404	6.21E-08	8.84E-08	2.84E-06	3.97E-06		608	8.12E-06	1.90E-05	9.26E-05	7.92E-05
408	5.81E-08	1.80E-07	2.08E-06	4.16E-06		612	1.23E-05	1.95E-05	1.37E-04	8.13E-05
412	5.67E-08	1.89E-07	1.23E-06	4.48E-06		616	8.49E-06	1.99E-05	9.46E-05	8.27E-05
416	5.58E-08	7.90E-08	1.00E-06	4.64E-06		620	4.12E-06	1.99E-05	5.33E-05	8.32E-05
420	5.33E-08	2.86E-07	2.01E-06	5.36E-06		624	2.03E-06	2.01E-05	3.70E-05	8.22E-05
424	5.01E-08	5.01E-08	3.92E-06	5.46E-06		628	1.31E-06	2.00E-05	3.12E-05	8.10E-05
428	4.80E-08	7.64E-08	7.81E-06	5.87E-06		632	5.93E-07	1.95E-05	2.30E-05	7.95E-05
432	4.83E-07	4.38E-07	1.93E-05	6.58E-06		636	3.94E-08	1.92E-05	1.09E-05	7.85E-05
436	1.16E-06	7.26E-07	2.42E-05	6.89E-06		640	4.03E-08	1.86E-05	5.52E-06	7.75E-05
440	4.81E-07	3.56E-07	1.54E-05	7.02E-06		644	4.15E-08	1.80E-05	5.85E-06	7.60E-05
444	6.02E-08	2.55E-07	1.01E-05	7.10E-06		648	4.29E-08	1.79E-05	7.94E-06	7.58E-05
448	6.71E-08	6.35E-07	9.16E-06	7.41E-06		652	4.45E-08	1.75E-05	8.38E-06	7.49E-05
452	3.00E-07	6.09E-07	8.86E-06	7.96E-06		656	4.62E-08	1.75E-05	5.63E-06	7.37E-05
456	4.04E-08	8.99E-07	8.45E-06	7.99E-06		660	4.79E-08	1.73E-05	4.58E-06	7.20E-05
460	4.02E-08	5.08E-07	7.69E-06	8.08E-06		664	4.96E-08	1.69E-05	4.81E-06	7.01E-05
464	3.98E-08	6.89E-07	7.23E-06	8.25E-06		668	5.11E-08	1.63E-05	4.68E-06	6.76E-05
468	9.75E-08	7.43E-07	6.35E-06	8.32E-06		672	5.25E-08	1.55E-05	3.54E-06	6.54E-05
472	4.72E-08	8.53E-07	5.67E-06	7.91E-06		676	5.40E-08	1.52E-05	2.84E-06	6.31E-05
476	4.30E-08	6.50E-07	5.70E-06	7.62E-06		680	5.56E-08	1.45E-05	2.07E-06	5.99E-05
480	9.49E-08	4.39E-07	6.99E-06	7.63E-06		684	5.73E-08	1.41E-05	3.44E-06	5.69E-05
484	2.23E-07	2.90E-07	1.08E-05	7.66E-06		688	5.92E-08	1.35E-05	3.51E-06	5.34E-05
488	7.37E-07	5.13E-07	1.31E-05	7.54E-06		692	6.12E-08	1.30E-05	2.44E-06	5.13E-05
492	7.55E-07	7.80E-07	1.13E-05	7.31E-06		696	6.40E-08	1.15E-05	8.53E-07	4.77E-05
496	2.10E-07	6.70E-07	8.18E-06	7.27E-06		700	6.74E-08	1.10E-05	1.32E-06	4.55E-05
500	3.54E-08	3.43E-07	5.33E-06	6.74E-06		704	7.09E-08	1.01E-05	6.95E-06	4.29E-05
504	3.48E-08	2.99E-07	3.31E-06	6.25E-06		708	7.50E-08	9.53E-06	1.37E-05	4.00E-05
508	3.43E-08	2.06E-07	2.12E-06	5.86E-06		712	8.05E-08	8.23E-06	1.07E-05	3.73E-05
512	3.38E-08	3.38E-08	1.66E-06	5.90E-06		716	8.59E-08	7.68E-06	2.97E-06	3.64E-05
516	3.37E-08	1.33E-07	1.65E-06	6.11E-06		720	9.16E-08	6.54E-06	9.16E-08	3.38E-05
520	3.36E-08	6.06E-08	1.60E-06	5.97E-06		724	9.77E-08	5.62E-06	9.77E-08	3.20E-05
524	3.39E-08	3.73E-07	1.14E-06	5.80E-06		728	1.04E-07	4.29E-06	1.04E-07	2.88E-05
528	3.43E-08	3.77E-07	9.82E-07	5.99E-06		732	1.10E-07	2.90E-06	1.10E-07	2.65E-05
532	3.43E-08	3.44E-07	1.53E-06	5.92E-06		736	1.17E-07	1.53E-06	1.17E-07	2.43E-05
536	3.40E-08	3.27E-07	5.64E-06	5.51E-06		740	1.23E-07	1.10E-06	1.23E-07	2.05E-05
540	1.01E-06	3.07E-07	1.93E-05	5.63E-06		744	1.30E-07	1.30E-07	1.30E-07	1.73E-05
544	1.98E-06	4.02E-07	2.93E-05	5.80E-06		748	1.38E-07	2.05E-07	1.38E-07	1.64E-05
548	1.17E-06	2.47E-07	1.98E-05	5.65E-06		752	1.46E-07	1.90E-07	1.46E-07	1.52E-05
552	2.00E-07	3.01E-07	9.03E-06	5.87E-06		756	1.57E-07	1.57E-07	1.57E-07	1.18E-05
556	3.22E-08	5.10E-07	3.26E-06	6.57E-06		760	1.71E-07	1.71E-07	1.71E-07	9.16E-06
560	3.27E-08	5.86E-07	1.22E-06	7.59E-06		764	1.85E-07	1.85E-07	1.85E-07	8.50E-06
564	3.31E-08	9.79E-07	2.84E-07	8.72E-06		768	2.01E-07	2.01E-07	2.01E-07	5.95E-06
568	3.34E-08	1.06E-06	2.70E-07	1.09E-05		772	2.24E-07	2.24E-07	2.24E-07	3.37E-06
572	3.34E-08	1.82E-06	1.77E-06	1.42E-05		776	2.47E-07	2.47E-07	2.47E-07	1.22E-06
576	3.31E-08	3.29E-06	6.21E-06	1.85E-05		780	2.77E-07	2.77E-07	2.77E-07	1.37E-06
580	1.25E-07	5.00E-06	1.44E-05	2.44E-05						

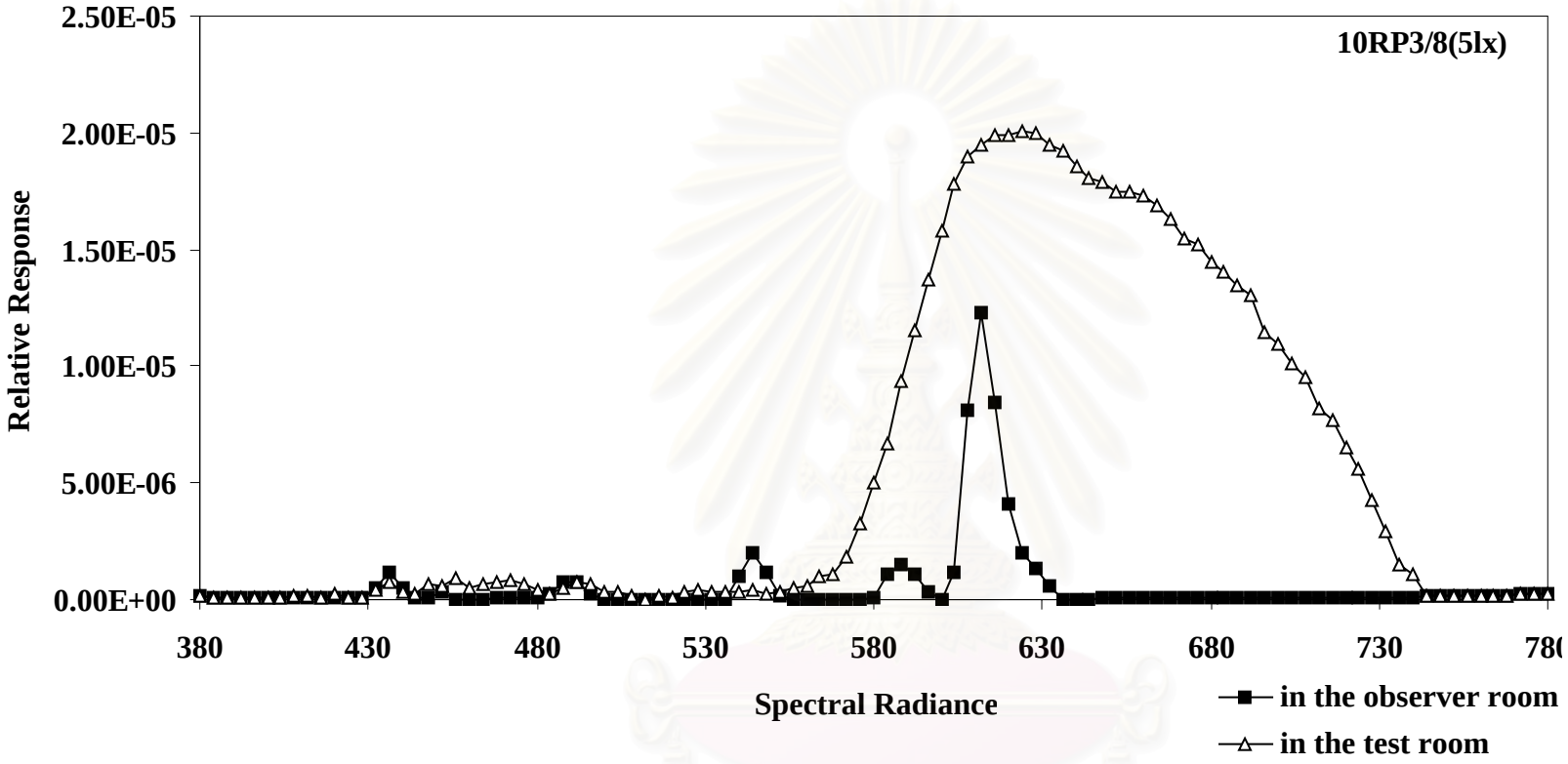


Fig.F-21a Compairison between the spatral of the color chart 10RP3/8 measured at the border of RVSI in the test room and at 5 lux in the observer room

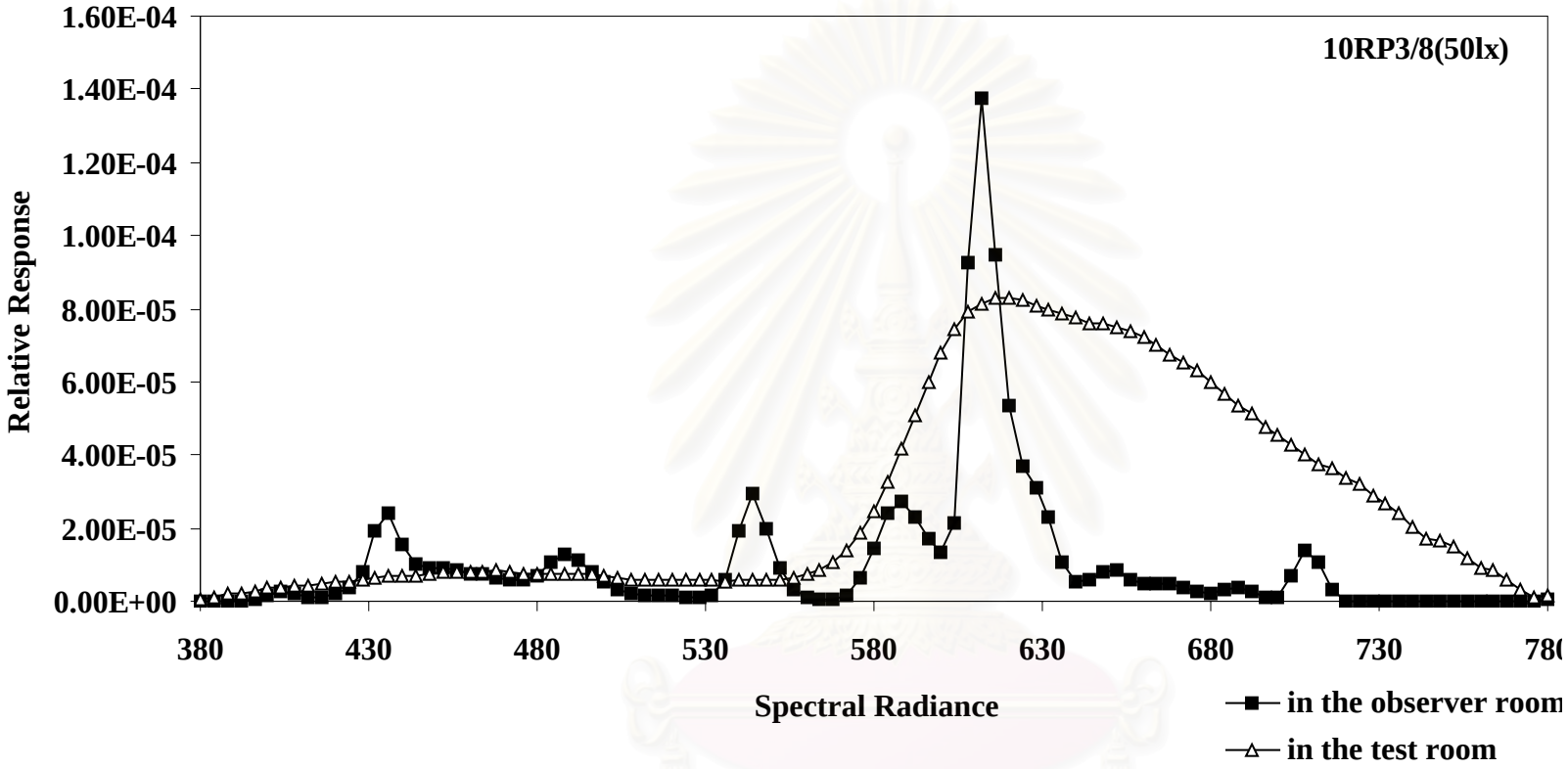


Fig.F-21b Compairison between the spatral of the color chart 10RP3/8 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-22 The spectral distribution data of 5R5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.85E-06		584	5.52E-06	1.13E-05	6.73E-05	6.63E-05
384	1.09E-07	1.09E-07	1.09E-07	3.20E-06		588	5.84E-06	1.26E-05	7.00E-05	7.24E-05
388	9.16E-08	9.16E-08	4.69E-07	4.29E-06		592	4.35E-06	1.37E-05	5.40E-05	7.76E-05
392	7.96E-08	7.96E-08	1.32E-07	3.76E-06		596	2.66E-06	1.44E-05	3.74E-05	8.21E-05
396	7.47E-08	7.47E-08	8.20E-07	4.59E-06		600	1.66E-06	1.51E-05	2.78E-05	8.57E-05
400	6.86E-08	6.86E-08	3.44E-06	4.38E-06		604	2.69E-06	1.54E-05	3.89E-05	8.84E-05
404	6.21E-08	6.21E-08	5.89E-06	5.53E-06		608	1.50E-05	1.58E-05	1.62E-04	8.89E-05
408	5.81E-08	1.22E-07	3.71E-06	6.69E-06		612	2.32E-05	1.57E-05	2.39E-04	8.88E-05
412	5.67E-08	5.87E-07	2.55E-06	7.01E-06		616	1.57E-05	1.60E-05	1.64E-04	8.87E-05
416	5.58E-08	2.51E-07	3.28E-06	7.64E-06		620	8.13E-06	1.60E-05	9.11E-05	8.77E-05
420	5.78E-08	4.35E-07	4.84E-06	7.81E-06		624	5.14E-06	1.54E-05	6.30E-05	8.62E-05
424	1.76E-07	1.42E-07	7.85E-06	8.83E-06		628	4.45E-06	1.55E-05	5.32E-05	8.49E-05
428	8.84E-07	1.24E-07	1.64E-05	9.47E-06		632	3.04E-06	1.53E-05	3.95E-05	8.28E-05
432	3.42E-06	2.86E-07	4.13E-05	1.01E-05		636	6.97E-07	1.46E-05	1.90E-05	8.14E-05
436	4.13E-06	4.90E-07	5.21E-05	1.03E-05		640	4.03E-08	1.41E-05	9.12E-06	8.04E-05
440	2.21E-06	2.35E-07	3.41E-05	1.10E-05		644	4.15E-08	1.39E-05	9.48E-06	7.84E-05
444	1.61E-06	3.01E-07	2.21E-05	1.14E-05		648	4.29E-08	1.38E-05	1.34E-05	7.79E-05
448	1.01E-06	4.86E-07	1.99E-05	1.16E-05		652	4.45E-08	1.37E-05	1.40E-05	7.68E-05
452	1.02E-06	9.00E-07	1.93E-05	1.21E-05		656	4.62E-08	1.33E-05	9.92E-06	7.54E-05
456	8.66E-07	9.96E-07	1.89E-05	1.32E-05		660	4.79E-08	1.30E-05	9.05E-06	7.36E-05
460	1.09E-06	1.21E-06	1.81E-05	1.40E-05		664	4.96E-08	1.25E-05	9.85E-06	7.16E-05
464	9.30E-07	1.58E-06	1.73E-05	1.45E-05		668	5.11E-08	1.21E-05	8.62E-06	6.95E-05
468	8.70E-07	1.59E-06	1.65E-05	1.47E-05		672	5.25E-08	1.17E-05	6.90E-06	6.74E-05
472	4.36E-07	1.67E-06	1.55E-05	1.52E-05		676	5.40E-08	1.09E-05	6.41E-06	6.43E-05
476	4.78E-07	1.91E-06	1.53E-05	1.60E-05		680	5.56E-08	1.04E-05	6.12E-06	6.14E-05
480	1.24E-06	2.24E-06	1.94E-05	1.63E-05		684	5.73E-08	9.95E-06	6.40E-06	5.82E-05
484	2.14E-06	2.22E-06	2.97E-05	1.69E-05		688	5.92E-08	9.39E-06	6.69E-06	5.48E-05
488	2.79E-06	2.20E-06	3.67E-05	1.78E-05		692	6.12E-08	9.17E-06	5.45E-06	5.24E-05
492	2.67E-06	2.29E-06	3.37E-05	1.87E-05		696	6.40E-08	8.11E-06	2.92E-06	4.83E-05
496	1.67E-06	2.07E-06	2.53E-05	1.85E-05		700	6.74E-08	7.58E-06	4.12E-06	4.60E-05
500	6.13E-07	2.55E-06	1.60E-05	1.89E-05		704	7.09E-08	7.36E-06	1.32E-05	4.36E-05
504	2.06E-07	2.55E-06	1.15E-05	1.93E-05		708	7.50E-08	6.52E-06	2.48E-05	4.10E-05
508	3.43E-08	2.43E-06	8.98E-06	1.95E-05		712	8.05E-08	5.39E-06	1.89E-05	3.86E-05
512	3.38E-08	2.57E-06	7.98E-06	1.97E-05		716	8.59E-08	4.99E-06	7.88E-06	3.65E-05
516	3.37E-08	2.66E-06	7.19E-06	2.04E-05		720	9.16E-08	3.26E-06	9.04E-07	3.40E-05
520	3.36E-08	2.95E-06	6.30E-06	2.10E-05		724	9.77E-08	1.96E-06	9.77E-08	3.17E-05
524	3.39E-08	3.16E-06	5.30E-06	2.16E-05		728	1.04E-07	1.30E-06	1.04E-07	2.92E-05
528	3.43E-08	3.31E-06	5.44E-06	2.20E-05		732	1.10E-07	9.17E-07	1.10E-07	2.58E-05
532	3.43E-08	3.15E-06	7.63E-06	2.26E-05		736	1.17E-07	1.17E-07	1.17E-07	2.33E-05
536	1.27E-06	2.99E-06	2.29E-05	2.30E-05		740	1.23E-07	1.23E-07	1.23E-07	2.24E-05
540	6.35E-06	3.00E-06	7.28E-05	2.32E-05		744	1.30E-07	1.30E-07	1.30E-07	2.02E-05
544	1.01E-05	3.62E-06	1.10E-04	2.36E-05		748	1.38E-07	1.38E-07	1.38E-07	1.80E-05
548	6.95E-06	4.06E-06	7.36E-05	2.49E-05		752	1.46E-07	1.46E-07	1.46E-07	1.50E-05
552	3.00E-06	4.39E-06	3.40E-05	2.65E-05		756	1.57E-07	1.57E-07	1.57E-07	1.35E-05
556	7.02E-07	4.65E-06	1.39E-05	2.85E-05		760	1.71E-07	1.71E-07	1.71E-07	1.04E-05
560	3.27E-08	5.10E-06	6.13E-06	3.16E-05		764	1.85E-07	1.85E-07	1.85E-07	7.97E-06
564	3.31E-08	5.68E-06	4.03E-06	3.59E-05		768	2.01E-07	2.01E-07	2.01E-07	4.15E-06
568	3.34E-08	6.96E-06	4.10E-06	4.14E-05		772	2.24E-07	2.24E-07	2.24E-07	4.84E-06
572	1.34E-07	8.08E-06	8.10E-06	4.70E-05		776	2.47E-07	2.47E-07	2.47E-07	1.16E-06
576	1.02E-06	9.39E-06	2.23E-05	5.33E-05		780	2.77E-07	2.77E-07	2.77E-07	6.48E-07
580	3.00E-06	1.01E-05	4.49E-05	5.96E-05						

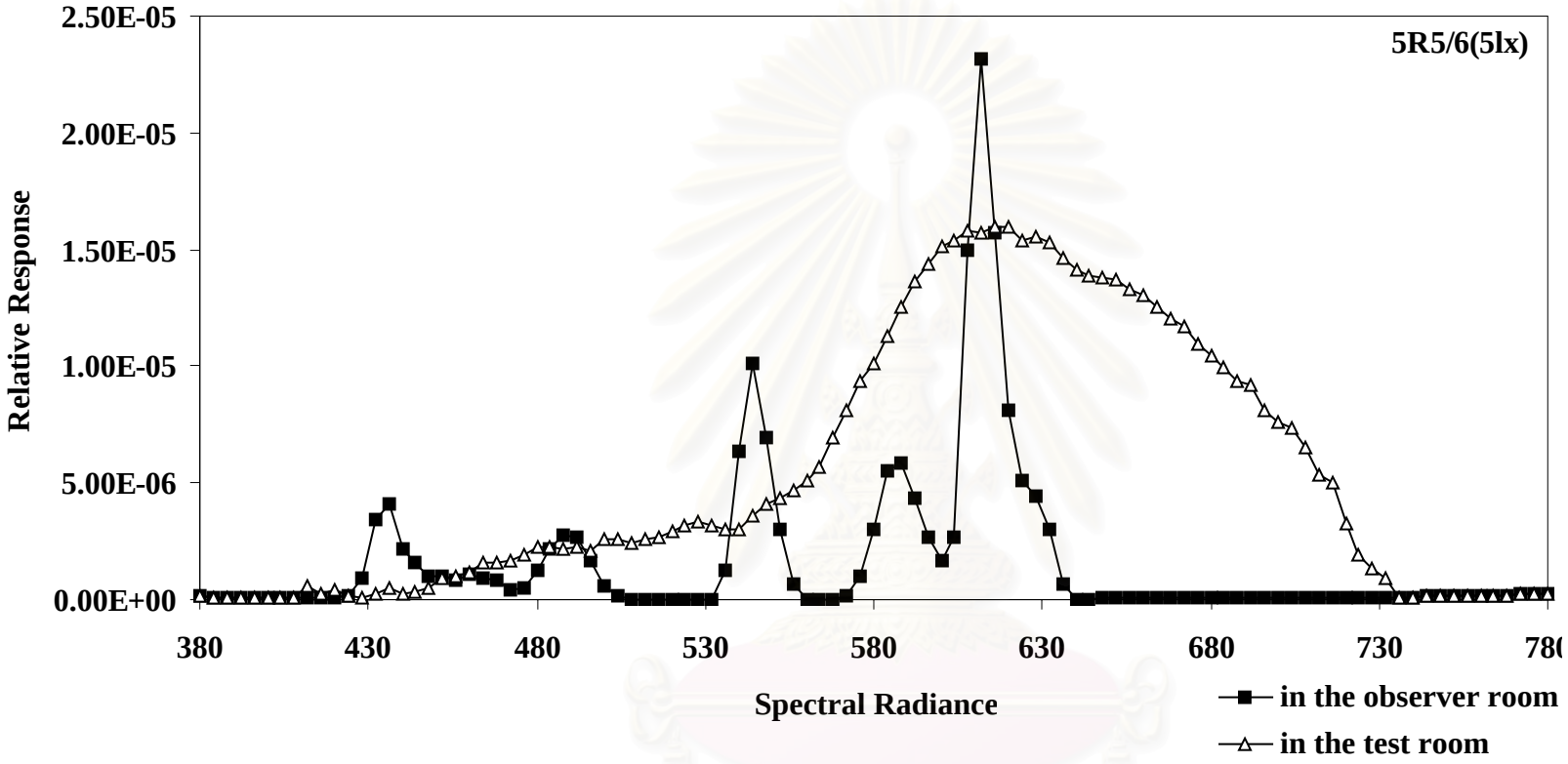


Fig.F-22a Compairison between the spatral of the color chart 5R5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room

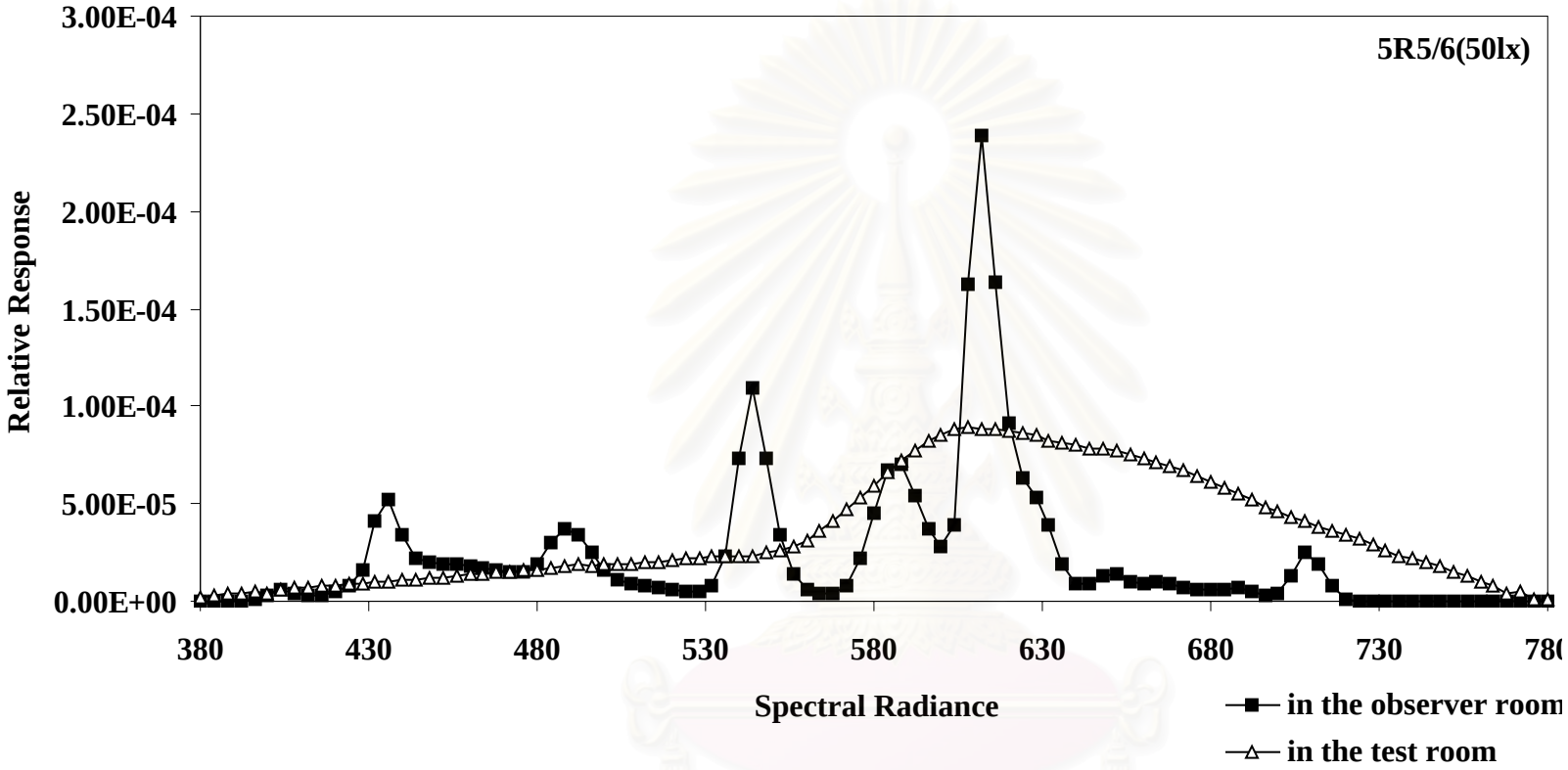


Fig.F-22b Compairison between the spatral of the color chart 5R5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-23 The spectral distribution data of 10R3/4 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	6.81E-07		584	1.44E-06	1.08E-05	2.63E-05	5.70E-05
384	1.09E-07	1.09E-07	1.09E-07	1.72E-06		588	1.51E-06	1.18E-05	2.71E-05	6.13E-05
388	9.16E-08	9.16E-08	9.16E-08	2.12E-06		592	9.12E-07	1.27E-05	2.04E-05	6.46E-05
392	7.96E-08	7.96E-08	9.41E-08	1.55E-06		596	4.89E-07	1.33E-05	1.38E-05	6.75E-05
396	7.47E-08	7.47E-08	3.53E-07	1.97E-06		600	9.60E-08	1.37E-05	9.93E-06	6.95E-05
400	6.86E-08	6.86E-08	8.38E-07	3.32E-06		604	4.59E-07	1.38E-05	1.42E-05	7.12E-05
404	6.21E-08	6.21E-08	1.24E-06	3.35E-06		608	4.96E-06	1.41E-05	6.04E-05	7.16E-05
408	5.81E-08	5.81E-08	5.44E-07	3.71E-06		612	7.84E-06	1.43E-05	8.91E-05	7.09E-05
412	5.67E-08	5.67E-08	9.42E-08	3.74E-06		616	5.00E-06	1.42E-05	6.09E-05	7.00E-05
416	5.58E-08	5.58E-08	4.54E-07	3.74E-06		620	1.94E-06	1.38E-05	3.37E-05	6.93E-05
420	5.33E-08	2.86E-07	1.20E-06	4.86E-06		624	8.53E-07	1.38E-05	2.30E-05	6.81E-05
424	5.01E-08	5.01E-08	2.20E-06	5.08E-06		628	6.52E-07	1.33E-05	1.89E-05	6.64E-05
428	1.19E-07	4.80E-08	5.14E-06	4.93E-06		632	4.43E-07	1.31E-05	1.37E-05	6.49E-05
432	3.21E-07	4.68E-08	1.36E-05	5.43E-06		636	3.94E-08	1.25E-05	6.14E-06	6.35E-05
436	3.68E-07	4.60E-08	1.72E-05	5.80E-06		640	4.03E-08	1.20E-05	2.49E-06	6.20E-05
440	1.46E-07	4.53E-08	1.13E-05	6.35E-06		644	4.15E-08	1.15E-05	2.15E-06	6.06E-05
444	4.38E-08	7.94E-08	7.14E-06	6.59E-06		648	4.29E-08	1.15E-05	3.86E-06	6.03E-05
448	1.51E-07	3.74E-07	6.68E-06	6.40E-06		652	4.45E-08	1.18E-05	4.21E-06	5.94E-05
452	4.09E-08	5.23E-07	6.35E-06	7.21E-06		656	4.62E-08	1.12E-05	2.57E-06	5.83E-05
456	4.04E-08	5.82E-07	6.25E-06	8.24E-06		660	4.79E-08	1.04E-05	2.13E-06	5.71E-05
460	4.02E-08	1.19E-06	5.77E-06	8.16E-06		664	4.96E-08	1.00E-05	2.33E-06	5.49E-05
464	3.98E-08	1.39E-06	5.26E-06	7.99E-06		668	5.11E-08	9.95E-06	1.46E-06	5.31E-05
468	3.91E-08	5.40E-07	5.02E-06	8.51E-06		672	5.25E-08	9.64E-06	6.49E-07	5.13E-05
472	3.82E-08	4.18E-07	5.07E-06	9.18E-06		676	5.40E-08	9.04E-06	9.31E-07	4.96E-05
476	3.71E-08	9.10E-07	5.18E-06	9.28E-06		680	5.56E-08	8.96E-06	1.48E-06	4.68E-05
480	3.65E-08	7.16E-07	6.71E-06	1.00E-05		684	5.73E-08	8.31E-06	1.38E-06	4.40E-05
484	3.20E-07	6.62E-07	1.12E-05	1.04E-05		688	5.92E-08	7.86E-06	1.12E-06	4.16E-05
488	8.05E-07	9.21E-07	1.36E-05	1.10E-05		692	6.12E-08	7.42E-06	7.97E-07	3.92E-05
492	5.85E-07	1.36E-06	1.19E-05	1.17E-05		696	6.40E-08	6.76E-06	6.40E-08	3.58E-05
496	9.41E-08	1.62E-06	8.95E-06	1.18E-05		700	6.74E-08	6.32E-06	2.32E-07	3.42E-05
500	3.54E-08	1.54E-06	5.51E-06	1.24E-05		704	7.09E-08	5.68E-06	2.39E-06	3.19E-05
504	3.48E-08	1.22E-06	3.81E-06	1.27E-05		708	7.50E-08	5.10E-06	6.05E-06	3.12E-05
508	3.43E-08	1.51E-06	3.03E-06	1.27E-05		712	8.05E-08	4.25E-06	4.89E-06	2.94E-05
512	3.38E-08	2.04E-06	2.53E-06	1.29E-05		716	8.59E-08	4.26E-06	1.15E-06	2.80E-05
516	3.37E-08	1.87E-06	2.25E-06	1.34E-05		720	9.16E-08	2.86E-06	9.16E-08	2.55E-05
520	3.36E-08	1.55E-06	2.17E-06	1.40E-05		724	9.77E-08	1.90E-06	9.77E-08	2.24E-05
524	3.39E-08	1.80E-06	1.70E-06	1.45E-05		728	1.04E-07	1.88E-06	1.04E-07	1.85E-05
528	3.43E-08	2.02E-06	1.64E-06	1.49E-05		732	1.10E-07	1.65E-06	1.10E-07	1.68E-05
532	3.43E-08	2.16E-06	2.38E-06	1.51E-05		736	1.17E-07	1.58E-07	1.17E-07	1.64E-05
536	3.40E-08	2.27E-06	8.40E-06	1.57E-05		740	1.23E-07	1.23E-07	1.23E-07	1.61E-05
540	1.78E-06	2.40E-06	2.85E-05	1.60E-05		744	1.30E-07	1.30E-07	1.30E-07	1.37E-05
544	3.51E-06	2.88E-06	4.33E-05	1.64E-05		748	1.38E-07	1.38E-07	1.38E-07	1.09E-05
548	2.20E-06	2.82E-06	2.91E-05	1.78E-05		752	1.46E-07	1.46E-07	1.46E-07	9.61E-06
552	6.85E-07	3.41E-06	1.31E-05	1.95E-05		756	1.57E-07	1.57E-07	1.57E-07	7.48E-06
556	3.22E-08	4.25E-06	4.59E-06	2.19E-05		760	1.71E-07	1.71E-07	1.71E-07	4.98E-06
560	3.27E-08	5.06E-06	1.66E-06	2.53E-05		764	1.85E-07	1.85E-07	1.85E-07	3.18E-06
564	3.31E-08	5.78E-06	1.14E-06	3.01E-05		768	2.01E-07	2.01E-07	2.01E-07	8.22E-07
568	3.34E-08	6.68E-06	9.83E-07	3.57E-05		772	2.24E-07	2.24E-07	2.24E-07	1.62E-06
572	3.34E-08	7.86E-06	2.75E-06	4.16E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	3.31E-08	9.39E-06	8.39E-06	4.71E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	5.19E-07	9.99E-06	1.74E-05	5.21E-05						

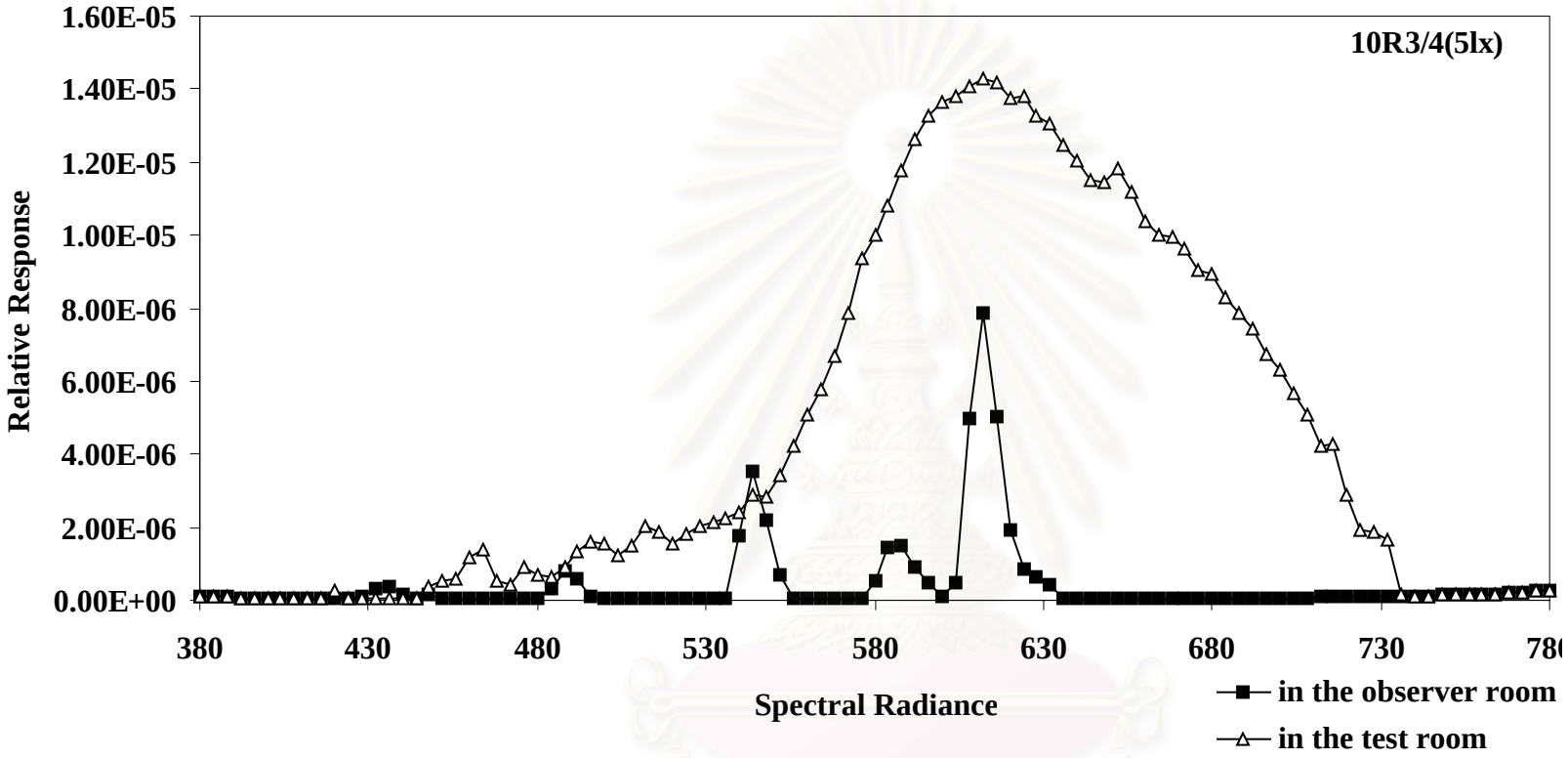


Fig.F-23a Compairison between the spatral of the color chart 10R3/4 measured at the border of RVSI in the test room and at 5 lux in the observer room.

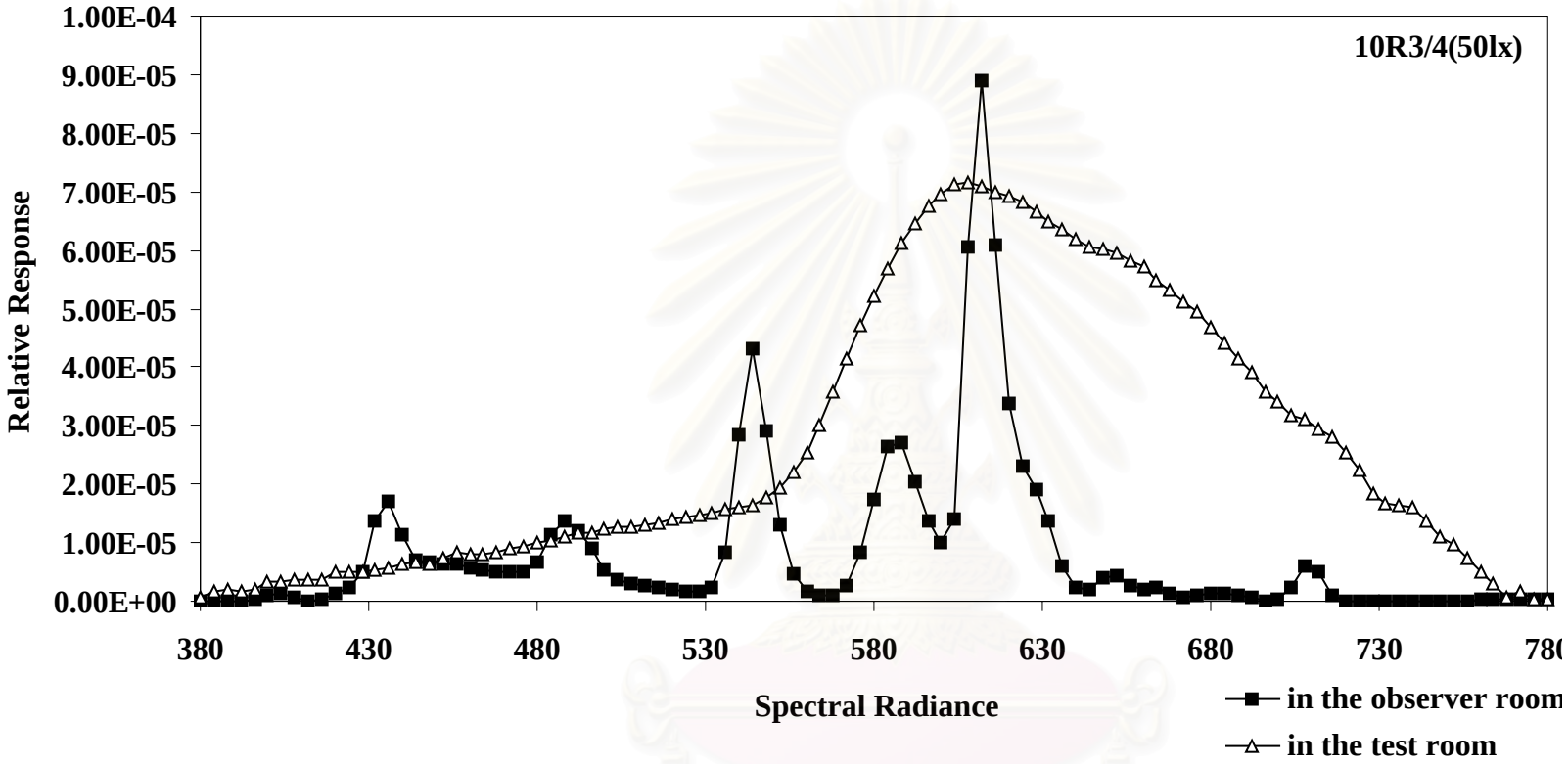


Fig.F-23b Compairison between the spatral of the color chart 10R3/4 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-24 The spectral distribution data of 5YR5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.33E-07		584	5.69E-06	1.16E-05	6.63E-05	6.84E-05
384	1.09E-07	1.09E-07	1.09E-07	4.16E-07		588	5.77E-06	1.18E-05	6.82E-05	7.27E-05
388	9.16E-08	9.16E-08	9.16E-08	1.21E-06		592	4.12E-06	1.25E-05	5.20E-05	7.67E-05
392	7.96E-08	7.96E-08	8.39E-07	8.58E-07		596	2.23E-06	1.32E-05	3.55E-05	8.02E-05
396	7.47E-08	7.47E-08	1.05E-06	1.41E-06		600	1.52E-06	1.38E-05	2.62E-05	8.31E-05
400	6.86E-08	6.86E-08	2.01E-06	1.76E-06		604	2.46E-06	1.43E-05	3.68E-05	8.50E-05
404	6.21E-08	6.21E-08	3.11E-06	2.67E-06		608	1.38E-05	1.45E-05	1.51E-04	8.59E-05
408	5.81E-08	5.81E-08	1.88E-06	3.50E-06		612	2.15E-05	1.46E-05	2.22E-04	8.53E-05
412	5.67E-08	5.67E-08	1.53E-06	4.01E-06		616	1.45E-05	1.46E-05	1.53E-04	8.47E-05
416	5.58E-08	5.58E-08	1.85E-06	3.61E-06		620	7.14E-06	1.46E-05	8.51E-05	8.35E-05
420	5.33E-08	5.33E-08	2.46E-06	3.67E-06		624	4.27E-06	1.43E-05	5.88E-05	8.23E-05
424	5.01E-08	5.01E-08	4.13E-06	4.14E-06		628	3.37E-06	1.39E-05	4.89E-05	8.04E-05
428	3.46E-07	2.04E-07	9.31E-06	4.26E-06		632	2.25E-06	1.35E-05	3.62E-05	7.87E-05
432	1.59E-06	4.03E-07	2.37E-05	5.08E-06		636	5.51E-07	1.31E-05	1.76E-05	7.73E-05
436	1.94E-06	1.33E-07	2.97E-05	5.43E-06		640	4.03E-08	1.29E-05	8.74E-06	7.60E-05
440	5.49E-07	5.97E-08	1.96E-05	5.38E-06		644	4.15E-08	1.27E-05	9.08E-06	7.46E-05
444	5.06E-07	2.22E-07	1.29E-05	5.66E-06		648	4.29E-08	1.24E-05	1.29E-05	7.36E-05
448	3.45E-07	5.39E-08	1.15E-05	5.98E-06		652	4.45E-08	1.23E-05	1.30E-05	7.33E-05
452	6.67E-07	4.09E-08	1.15E-05	6.59E-06		656	4.62E-08	1.20E-05	9.14E-06	7.21E-05
456	4.59E-07	4.04E-08	1.08E-05	7.36E-06		660	4.79E-08	1.12E-05	7.99E-06	7.01E-05
460	3.53E-07	4.02E-08	1.06E-05	7.68E-06		664	4.96E-08	1.06E-05	8.69E-06	6.78E-05
464	7.07E-08	1.13E-07	1.05E-05	7.95E-06		668	5.11E-08	1.00E-05	7.25E-06	6.56E-05
468	1.85E-07	2.44E-07	9.70E-06	8.04E-06		672	5.25E-08	1.03E-05	5.81E-06	6.31E-05
472	6.13E-08	3.02E-07	9.63E-06	8.74E-06		676	5.40E-08	9.73E-06	5.96E-06	6.07E-05
476	6.83E-08	3.75E-07	9.51E-06	9.55E-06		680	5.56E-08	9.72E-06	5.78E-06	5.71E-05
480	2.66E-07	6.06E-07	1.29E-05	9.76E-06		684	5.73E-08	9.25E-06	6.16E-06	5.46E-05
484	1.28E-06	7.90E-07	2.10E-05	1.09E-05		688	5.92E-08	8.70E-06	6.13E-06	5.24E-05
488	1.88E-06	1.17E-06	2.65E-05	1.20E-05		692	6.12E-08	7.98E-06	4.86E-06	4.92E-05
492	1.32E-06	1.12E-06	2.49E-05	1.30E-05		696	6.40E-08	7.09E-06	3.08E-06	4.62E-05
496	9.80E-07	1.65E-06	1.95E-05	1.42E-05		700	6.74E-08	6.87E-06	3.21E-06	4.41E-05
500	4.38E-07	1.66E-06	1.36E-05	1.58E-05		704	7.09E-08	6.46E-06	1.15E-05	4.09E-05
504	2.31E-07	2.18E-06	1.02E-05	1.73E-05		708	7.50E-08	5.75E-06	2.22E-05	3.93E-05
508	3.43E-08	2.60E-06	8.70E-06	1.85E-05		712	8.05E-08	5.14E-06	1.79E-05	3.74E-05
512	3.38E-08	2.38E-06	8.32E-06	1.98E-05		716	8.59E-08	3.74E-06	5.89E-06	3.48E-05
516	3.37E-08	2.41E-06	7.42E-06	2.13E-05		720	9.16E-08	2.88E-06	5.86E-07	3.28E-05
520	3.36E-08	2.97E-06	7.24E-06	2.33E-05		724	9.77E-08	2.26E-06	9.77E-08	3.02E-05
524	3.39E-08	3.26E-06	6.23E-06	2.45E-05		728	1.04E-07	1.98E-06	1.04E-07	2.70E-05
528	6.87E-08	3.45E-06	5.97E-06	2.54E-05		732	1.10E-07	6.55E-07	1.10E-07	2.46E-05
532	2.88E-07	4.00E-06	8.20E-06	2.56E-05		736	1.17E-07	1.58E-07	1.17E-07	2.27E-05
536	1.72E-06	4.57E-06	2.50E-05	2.61E-05		740	1.23E-07	4.15E-07	1.23E-07	2.01E-05
540	7.02E-06	4.52E-06	8.08E-05	2.69E-05		744	1.30E-07	1.30E-07	1.30E-07	1.82E-05
544	1.12E-05	5.03E-06	1.23E-04	2.78E-05		748	1.38E-07	1.38E-07	1.38E-07	1.51E-05
548	7.44E-06	4.94E-06	8.26E-05	2.95E-05		752	1.46E-07	1.46E-07	1.46E-07	1.24E-05
552	2.83E-06	5.15E-06	3.81E-05	3.20E-05		756	1.57E-07	1.57E-07	1.57E-07	1.16E-05
556	5.25E-07	5.40E-06	1.55E-05	3.45E-05		760	1.71E-07	1.71E-07	1.71E-07	1.03E-05
560	3.27E-08	6.15E-06	6.58E-06	3.82E-05		764	1.85E-07	1.85E-07	1.85E-07	7.69E-06
564	3.31E-08	7.20E-06	3.85E-06	4.29E-05		768	2.01E-07	2.01E-07	2.01E-07	5.17E-06
568	3.34E-08	7.62E-06	3.92E-06	4.80E-05		772	2.24E-07	2.24E-07	2.24E-07	4.60E-06
572	3.34E-08	9.04E-06	8.52E-06	5.35E-05		776	2.47E-07	2.47E-07	2.47E-07	3.40E-06
576	8.21E-07	9.80E-06	2.26E-05	5.90E-05		780	2.77E-07	2.77E-07	2.77E-07	8.43E-07
580	3.63E-06	1.05E-05	4.52E-05	6.38E-05						

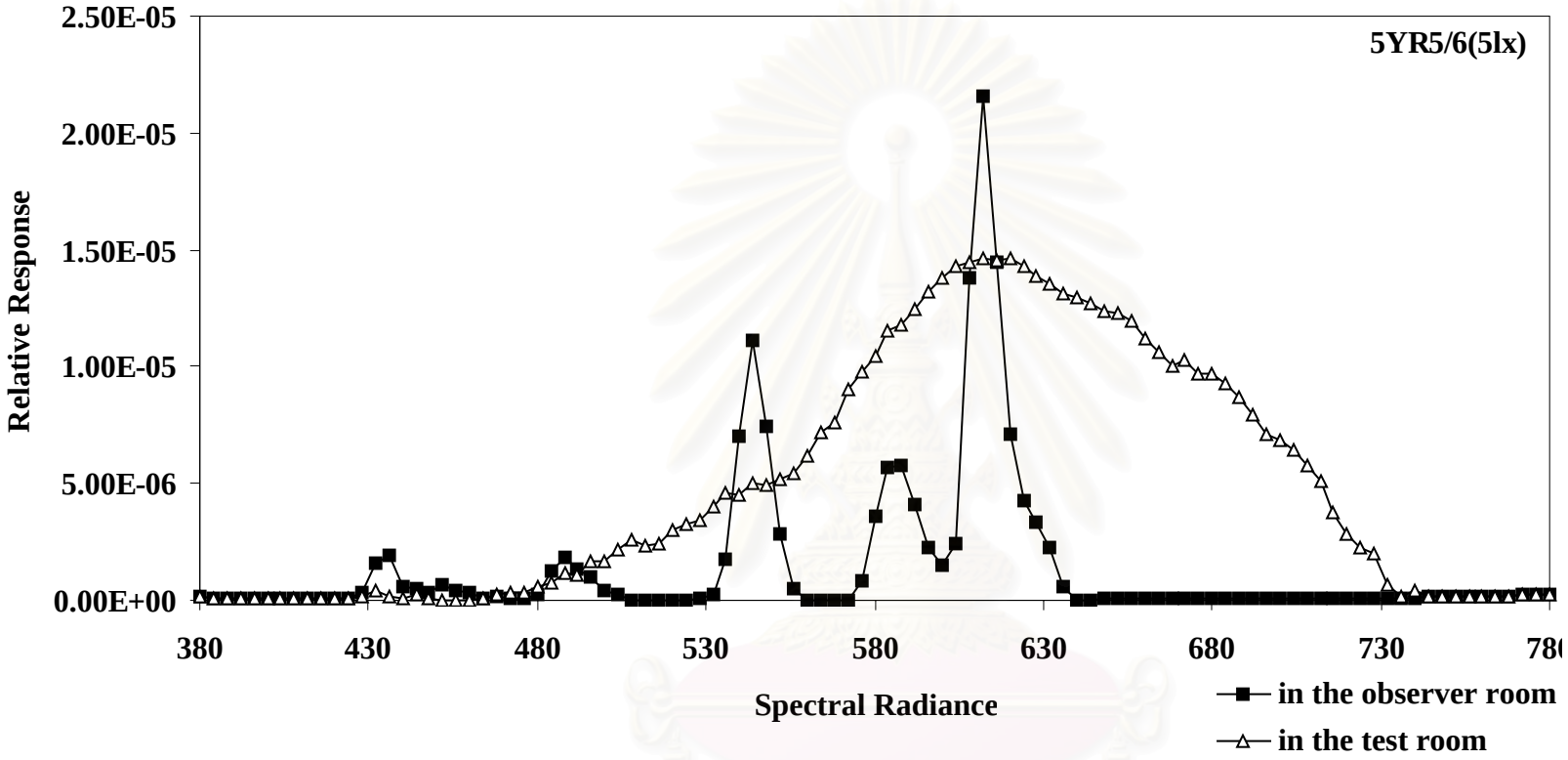


Fig.F-24a Compairison between the spatral of the color chart 5YR5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

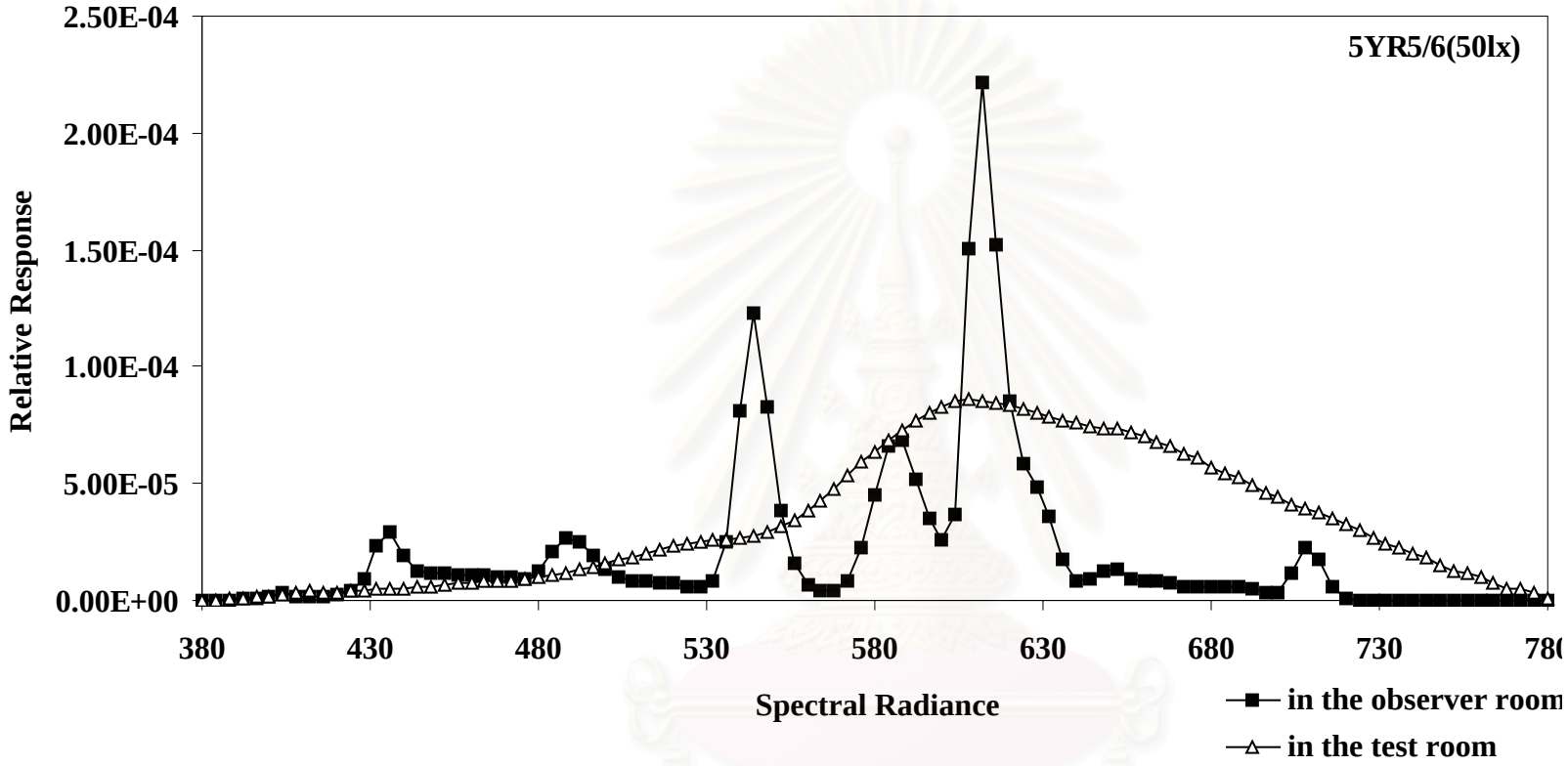


Fig.F-24b Compairison between the spatral of the color chart 5YR5/6 measured at the border of RVSI
in the test room and at 50lux in the observer room

Table F-25 The spectral distribution data of 5Y5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	8.14E-07		584	4.34E-06	1.05E-05	5.58E-05	6.90E-05
384	1.09E-07	1.09E-07	1.09E-07	4.43E-07		588	4.54E-06	1.03E-05	5.59E-05	7.02E-05
388	5.44E-07	9.16E-08	3.18E-07	1.09E-06		592	3.09E-06	1.07E-05	4.14E-05	7.21E-05
392	1.12E-07	7.96E-08	4.45E-07	1.22E-06		596	1.38E-06	1.07E-05	2.79E-05	7.36E-05
396	1.36E-07	7.47E-08	7.47E-08	1.68E-06		600	4.42E-07	1.10E-05	2.01E-05	7.49E-05
400	6.86E-08	6.86E-08	5.86E-07	1.78E-06		604	1.77E-06	1.12E-05	2.74E-05	7.55E-05
404	6.21E-08	6.21E-08	1.96E-06	1.79E-06		608	1.03E-05	1.13E-05	1.12E-04	7.52E-05
408	5.81E-08	5.81E-08	1.47E-06	2.16E-06		612	1.57E-05	1.08E-05	1.66E-04	7.42E-05
412	5.67E-08	5.67E-08	6.42E-07	2.25E-06		616	1.03E-05	1.09E-05	1.13E-04	7.38E-05
416	5.58E-08	5.58E-08	1.18E-06	2.65E-06		620	5.16E-06	1.10E-05	6.28E-05	7.25E-05
420	5.33E-08	5.33E-08	2.08E-06	2.46E-06		624	3.09E-06	1.05E-05	4.31E-05	7.11E-05
424	5.01E-08	5.01E-08	2.62E-06	2.26E-06		628	1.94E-06	1.04E-05	3.61E-05	6.97E-05
428	4.80E-08	4.80E-08	5.74E-06	2.46E-06		632	1.12E-06	1.02E-05	2.63E-05	6.79E-05
432	5.63E-07	4.68E-08	1.45E-05	2.57E-06		636	1.56E-07	9.91E-06	1.28E-05	6.64E-05
436	1.01E-06	1.22E-07	1.81E-05	2.75E-06		640	4.03E-08	1.01E-05	6.06E-06	6.52E-05
440	2.90E-07	2.43E-07	1.23E-05	3.10E-06		644	4.15E-08	9.13E-06	6.12E-06	6.45E-05
444	4.38E-08	8.49E-08	7.79E-06	3.71E-06		648	4.29E-08	8.36E-06	8.88E-06	6.35E-05
448	8.16E-08	4.20E-08	7.17E-06	3.44E-06		652	4.45E-08	8.24E-06	9.31E-06	6.28E-05
452	9.87E-08	4.09E-08	7.03E-06	3.86E-06		656	4.62E-08	8.59E-06	6.35E-06	6.13E-05
456	1.20E-07	4.04E-08	6.86E-06	4.92E-06		660	4.79E-08	8.30E-06	5.45E-06	5.98E-05
460	4.02E-08	4.02E-08	7.05E-06	5.53E-06		664	4.96E-08	7.95E-06	6.02E-06	5.77E-05
464	3.98E-08	1.61E-07	6.94E-06	5.69E-06		668	5.11E-08	7.52E-06	5.25E-06	5.55E-05
468	3.91E-08	1.76E-07	6.60E-06	6.05E-06		672	5.25E-08	7.19E-06	3.87E-06	5.38E-05
472	3.82E-08	5.56E-08	6.19E-06	6.01E-06		676	5.40E-08	6.76E-06	3.41E-06	5.17E-05
476	3.71E-08	1.93E-07	6.12E-06	6.20E-06		680	5.56E-08	6.44E-06	3.96E-06	4.93E-05
480	3.65E-08	1.24E-07	8.69E-06	6.88E-06		684	5.73E-08	6.19E-06	4.17E-06	4.69E-05
484	5.41E-07	3.24E-07	1.48E-05	8.00E-06		688	5.92E-08	5.84E-06	3.97E-06	4.40E-05
488	9.53E-07	4.05E-07	1.92E-05	9.60E-06		692	6.12E-08	5.53E-06	2.69E-06	4.14E-05
492	1.25E-06	1.09E-06	1.84E-05	1.14E-05		696	6.40E-08	4.72E-06	9.51E-07	3.85E-05
496	1.08E-06	1.02E-06	1.54E-05	1.32E-05		700	6.74E-08	3.39E-06	1.47E-06	3.74E-05
500	2.48E-07	1.32E-06	1.13E-05	1.61E-05		704	7.09E-08	2.93E-06	7.82E-06	3.49E-05
504	1.82E-07	1.99E-06	9.46E-06	1.91E-05		708	7.50E-08	2.50E-06	1.58E-05	3.23E-05
508	3.43E-08	2.73E-06	8.75E-06	2.32E-05		712	8.05E-08	2.48E-06	1.27E-05	3.06E-05
512	3.38E-08	3.48E-06	8.85E-06	2.75E-05		716	8.59E-08	2.26E-06	3.48E-06	2.85E-05
516	3.37E-08	4.26E-06	8.86E-06	3.16E-05		720	9.16E-08	1.25E-06	9.16E-08	2.63E-05
520	3.36E-08	4.69E-06	8.48E-06	3.55E-05		724	9.77E-08	2.39E-07	9.77E-08	2.47E-05
524	3.39E-08	5.44E-06	7.72E-06	3.89E-05		728	1.04E-07	1.04E-07	1.04E-07	2.16E-05
528	3.43E-08	6.01E-06	7.71E-06	4.12E-05		732	1.10E-07	1.10E-07	1.10E-07	2.12E-05
532	3.52E-07	6.12E-06	1.09E-05	4.23E-05		736	1.17E-07	1.17E-07	1.17E-07	1.91E-05
536	2.83E-06	6.69E-06	3.31E-05	4.38E-05		740	1.23E-07	1.23E-07	1.23E-07	1.65E-05
540	9.94E-06	6.80E-06	1.07E-04	4.49E-05		744	1.30E-07	1.30E-07	1.30E-07	1.38E-05
544	1.58E-05	7.23E-06	1.61E-04	4.58E-05		748	1.38E-07	1.38E-07	1.38E-07	1.25E-05
548	1.07E-05	7.36E-06	1.08E-04	4.80E-05		752	1.46E-07	1.46E-07	1.46E-07	1.18E-05
552	4.45E-06	7.92E-06	4.96E-05	5.04E-05		756	1.57E-07	1.57E-07	1.57E-07	9.55E-06
556	1.40E-06	8.48E-06	1.95E-05	5.31E-05		760	1.71E-07	1.71E-07	1.71E-07	7.40E-06
560	1.98E-07	8.90E-06	8.11E-06	5.61E-05		764	1.85E-07	1.85E-07	1.85E-07	4.10E-06
564	3.31E-08	9.34E-06	5.11E-06	5.93E-05		768	2.01E-07	2.01E-07	2.01E-07	2.77E-06
568	3.34E-08	9.37E-06	4.39E-06	6.20E-05		772	2.24E-07	2.24E-07	2.24E-07	1.81E-06
572	3.34E-08	9.68E-06	7.83E-06	6.40E-05		776	2.47E-07	2.47E-07	2.47E-07	2.97E-06
576	7.68E-07	9.74E-06	1.99E-05	6.63E-05		780	2.77E-07	2.77E-07	2.77E-07	1.32E-06
580	2.42E-06	1.01E-05	3.91E-05	6.75E-05						

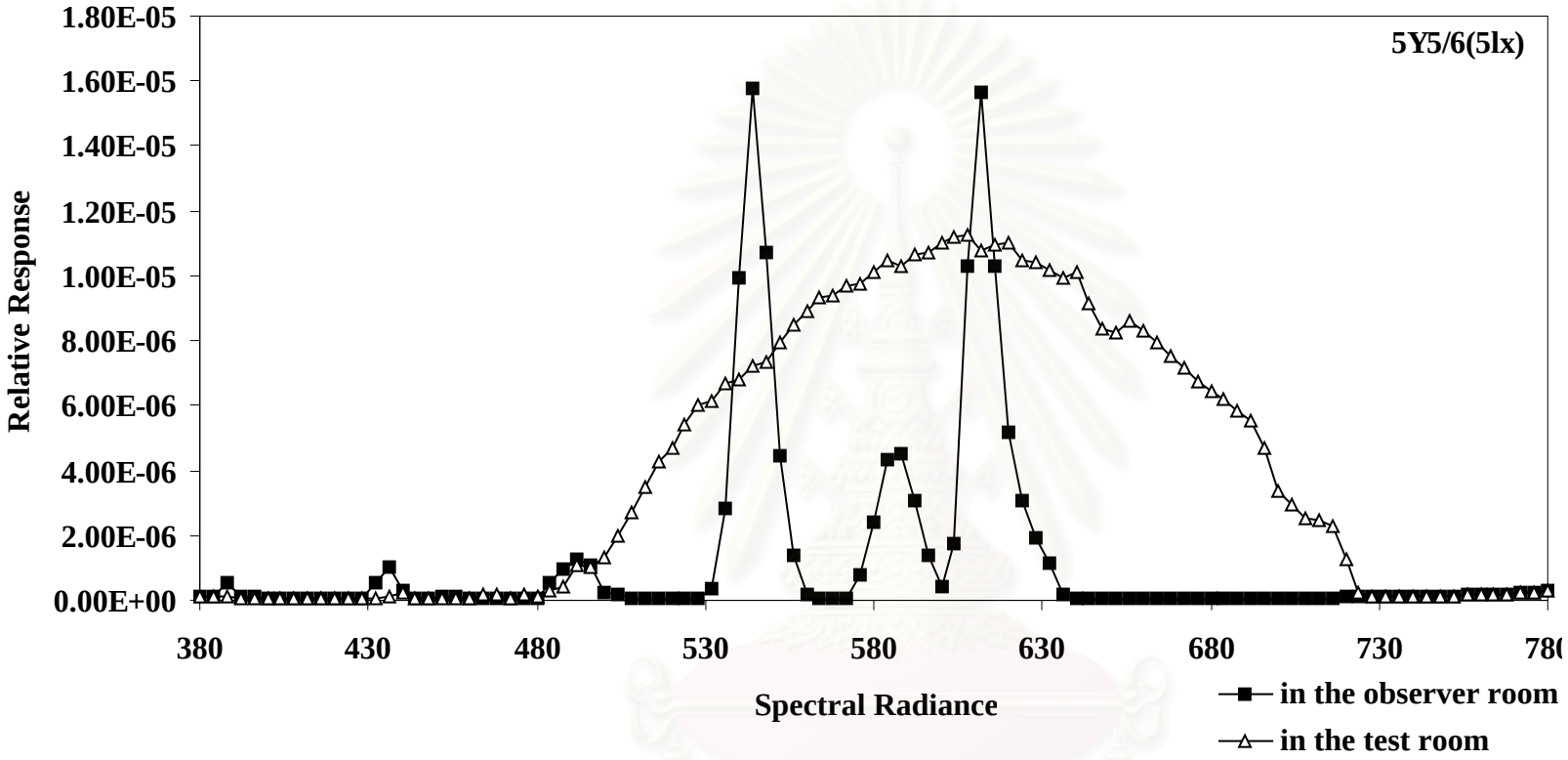


Fig.F-25a Compairison between the spatral of the color chart 5Y5/6 measured at the border of RVSI
in the test room and at 5 lux in the observer room

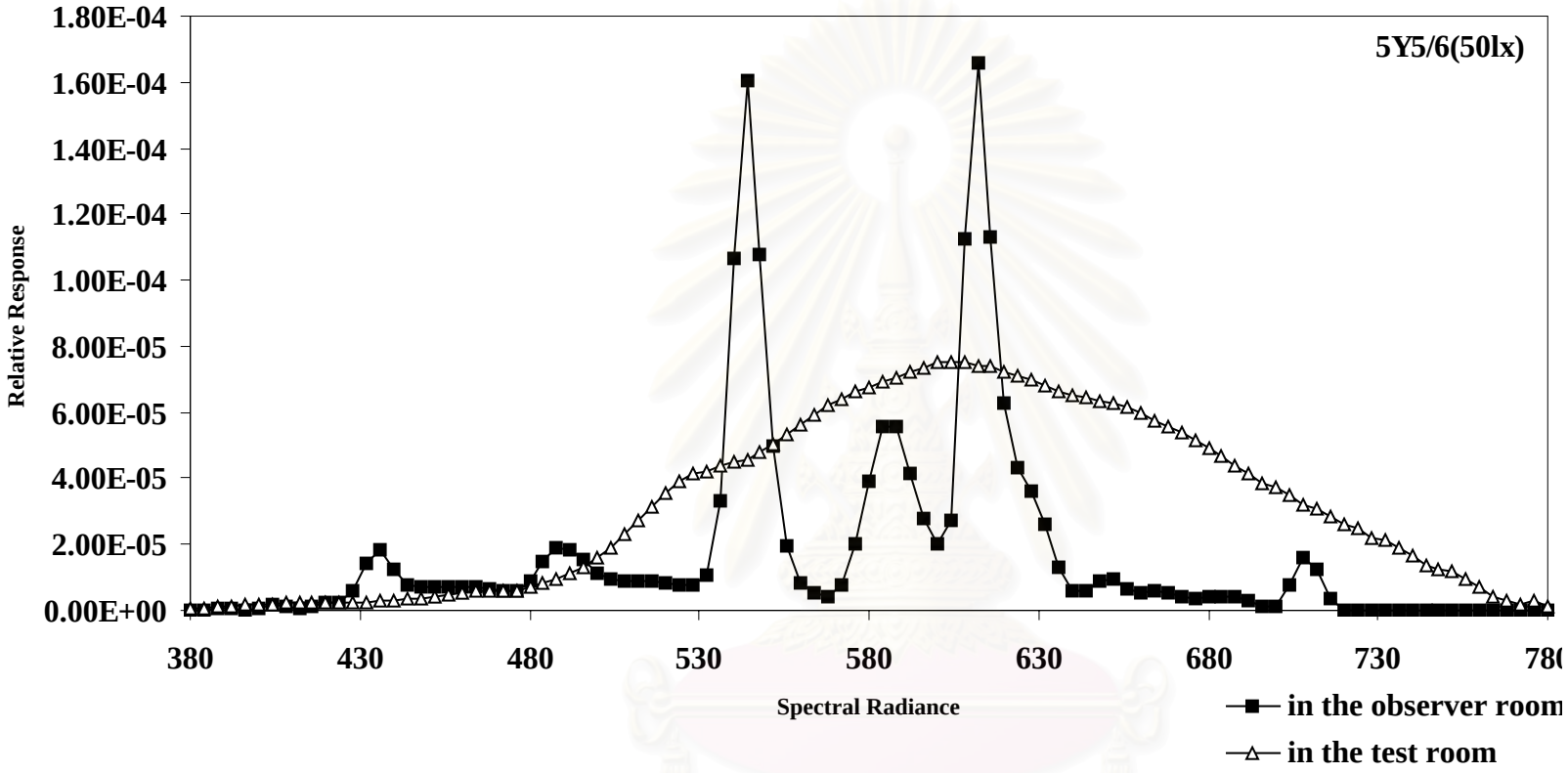


Fig.F-25b Compairison between the spatral of the color chart 5Y5/6 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-26 The spectral distribution data of 5Y4/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	2.17E-06		584	2.32E-06	9.70E-06	3.61E-05	5.88E-05
384	1.09E-07	1.09E-07	1.09E-07	1.25E-06		588	2.62E-06	9.91E-06	3.56E-05	5.94E-05
388	9.16E-08	9.16E-08	9.16E-08	1.56E-07		592	1.39E-06	1.03E-05	2.63E-05	6.09E-05
392	7.96E-08	7.96E-08	7.96E-08	1.13E-07		596	4.27E-07	1.03E-05	1.73E-05	6.26E-05
396	7.47E-08	7.47E-08	7.47E-08	5.98E-07		600	8.41E-08	1.07E-05	1.22E-05	6.38E-05
400	6.86E-08	6.86E-08	1.93E-07	6.32E-07		604	3.60E-07	1.06E-05	1.72E-05	6.46E-05
404	6.21E-08	6.21E-08	4.61E-07	9.56E-07		608	5.93E-06	1.02E-05	7.33E-05	6.42E-05
408	5.81E-08	5.81E-08	2.43E-07	8.77E-07		612	9.40E-06	9.83E-06	1.08E-04	6.32E-05
412	5.67E-08	5.67E-08	5.67E-08	1.12E-06		616	6.31E-06	9.60E-06	7.34E-05	6.21E-05
416	5.58E-08	5.58E-08	7.19E-07	1.12E-06		620	2.88E-06	9.84E-06	4.04E-05	6.16E-05
420	5.33E-08	5.33E-08	1.21E-06	6.99E-07		624	1.76E-06	9.81E-06	2.72E-05	6.00E-05
424	8.40E-08	5.01E-08	1.62E-06	1.36E-06		628	8.47E-07	1.01E-05	2.29E-05	5.86E-05
428	3.82E-07	4.80E-08	3.25E-06	1.66E-06		632	4.43E-07	9.37E-06	1.70E-05	5.74E-05
432	7.02E-07	4.68E-08	7.78E-06	1.68E-06		636	3.94E-08	9.31E-06	8.12E-06	5.62E-05
436	3.34E-07	4.60E-08	1.03E-05	1.87E-06		640	4.03E-08	8.91E-06	3.35E-06	5.50E-05
440	4.53E-08	4.53E-08	6.57E-06	1.61E-06		644	4.15E-08	8.48E-06	3.30E-06	5.34E-05
444	4.38E-08	4.38E-08	4.37E-06	1.92E-06		648	4.29E-08	8.66E-06	5.17E-06	5.32E-05
448	4.20E-08	4.20E-08	3.82E-06	2.62E-06		652	4.45E-08	8.32E-06	5.18E-06	5.29E-05
452	4.09E-08	4.09E-08	3.92E-06	2.41E-06		656	4.62E-08	8.07E-06	3.49E-06	5.16E-05
456	4.04E-08	4.04E-08	3.69E-06	2.87E-06		660	4.79E-08	7.78E-06	3.49E-06	4.95E-05
460	4.02E-08	4.02E-08	3.79E-06	3.15E-06		664	4.96E-08	7.27E-06	3.64E-06	4.81E-05
464	3.98E-08	6.41E-08	3.87E-06	3.44E-06		668	5.11E-08	7.05E-06	3.08E-06	4.65E-05
468	3.91E-08	4.90E-08	3.81E-06	3.44E-06		672	5.25E-08	6.56E-06	2.14E-06	4.44E-05
472	3.82E-08	3.82E-08	3.68E-06	3.64E-06		676	5.40E-08	6.08E-06	1.65E-06	4.23E-05
476	3.71E-08	3.71E-08	3.88E-06	4.01E-06		680	5.56E-08	5.88E-06	1.63E-06	4.04E-05
480	5.83E-08	6.92E-08	5.40E-06	4.65E-06		684	5.73E-08	6.11E-06	1.35E-06	3.80E-05
484	1.24E-07	9.66E-08	8.49E-06	5.65E-06		688	5.92E-08	5.28E-06	1.21E-06	3.59E-05
488	8.09E-08	3.58E-08	1.13E-05	6.67E-06		692	6.12E-08	4.36E-06	3.61E-07	3.43E-05
492	1.91E-07	1.91E-07	1.11E-05	8.05E-06		696	6.40E-08	3.88E-06	6.40E-08	3.19E-05
496	1.26E-07	8.68E-07	9.19E-06	1.02E-05		700	6.74E-08	3.89E-06	1.00E-06	3.05E-05
500	3.54E-08	1.11E-06	7.10E-06	1.25E-05		704	7.09E-08	3.54E-06	4.55E-06	2.92E-05
504	3.48E-08	1.42E-06	5.67E-06	1.51E-05		708	7.50E-08	3.14E-06	8.32E-06	2.68E-05
508	3.43E-08	2.16E-06	5.51E-06	1.83E-05		712	8.05E-08	1.93E-06	6.09E-06	2.56E-05
512	3.38E-08	2.76E-06	5.45E-06	2.18E-05		716	8.59E-08	5.10E-07	1.50E-06	2.38E-05
516	3.37E-08	3.59E-06	5.41E-06	2.56E-05		720	9.16E-08	9.66E-07	9.16E-08	2.18E-05
520	9.09E-08	4.03E-06	5.34E-06	2.90E-05		724	9.77E-08	2.39E-07	9.77E-08	2.07E-05
524	3.39E-08	4.76E-06	4.80E-06	3.19E-05		728	1.04E-07	1.04E-07	1.04E-07	1.89E-05
528	3.43E-08	5.12E-06	4.64E-06	3.33E-05		732	1.10E-07	1.10E-07	1.10E-07	1.61E-05
532	3.43E-08	5.36E-06	6.58E-06	3.43E-05		736	1.17E-07	1.17E-07	1.17E-07	1.58E-05
536	1.10E-06	5.59E-06	2.03E-05	3.49E-05		740	1.23E-07	1.23E-07	1.23E-07	1.55E-05
540	5.82E-06	5.79E-06	6.53E-05	3.55E-05		744	1.30E-07	1.30E-07	1.30E-07	1.13E-05
544	9.33E-06	5.92E-06	9.84E-05	3.65E-05		748	1.38E-07	1.38E-07	1.38E-07	9.79E-06
548	5.98E-06	6.37E-06	6.56E-05	3.78E-05		752	1.46E-07	1.46E-07	1.46E-07	8.69E-06
552	2.45E-06	6.84E-06	3.01E-05	4.01E-05		756	1.57E-07	1.57E-07	1.57E-07	7.60E-06
556	4.43E-07	7.27E-06	1.18E-05	4.24E-05		760	1.71E-07	1.71E-07	1.71E-07	6.01E-06
560	3.27E-08	7.93E-06	4.89E-06	4.51E-05		764	1.85E-07	1.85E-07	1.85E-07	5.54E-06
564	3.31E-08	8.47E-06	2.86E-06	4.85E-05		768	2.01E-07	2.01E-07	2.01E-07	5.40E-06
568	3.34E-08	8.86E-06	2.58E-06	5.08E-05		772	2.24E-07	2.24E-07	2.24E-07	1.31E-06
572	3.34E-08	9.04E-06	4.98E-06	5.35E-05		776	2.47E-07	2.47E-07	2.47E-07	8.03E-07
576	2.12E-07	9.34E-06	1.24E-05	5.55E-05		780	2.77E-07	2.77E-07	2.77E-07	8.24E-07
580	1.31E-06	9.65E-06	2.49E-05	5.74E-05						

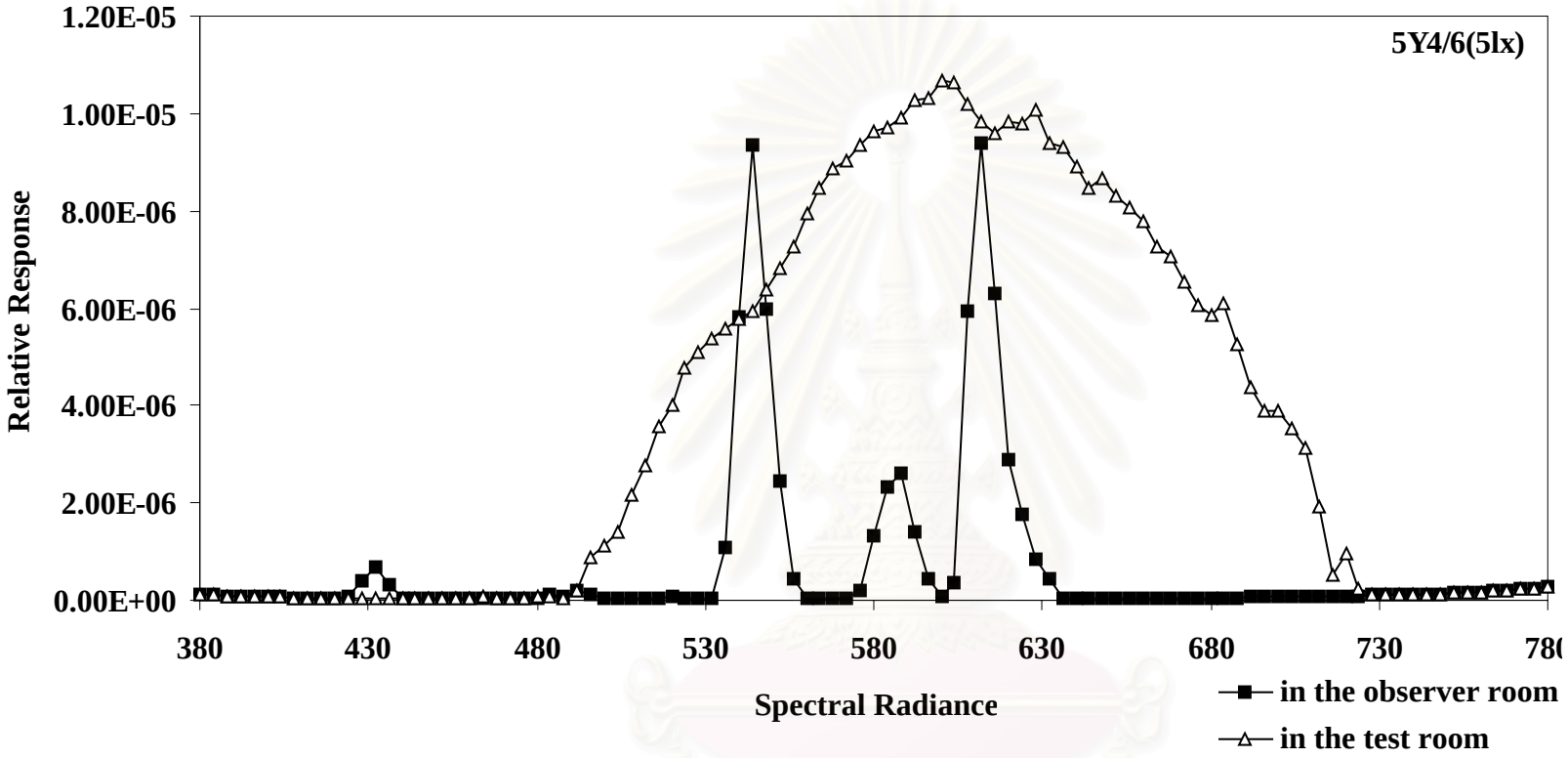


Fig.F-26a Compairison between the spatral of the color chart 5Y4/6 measured at the border of RVSI
in the test room and at 5 lux in the observer room

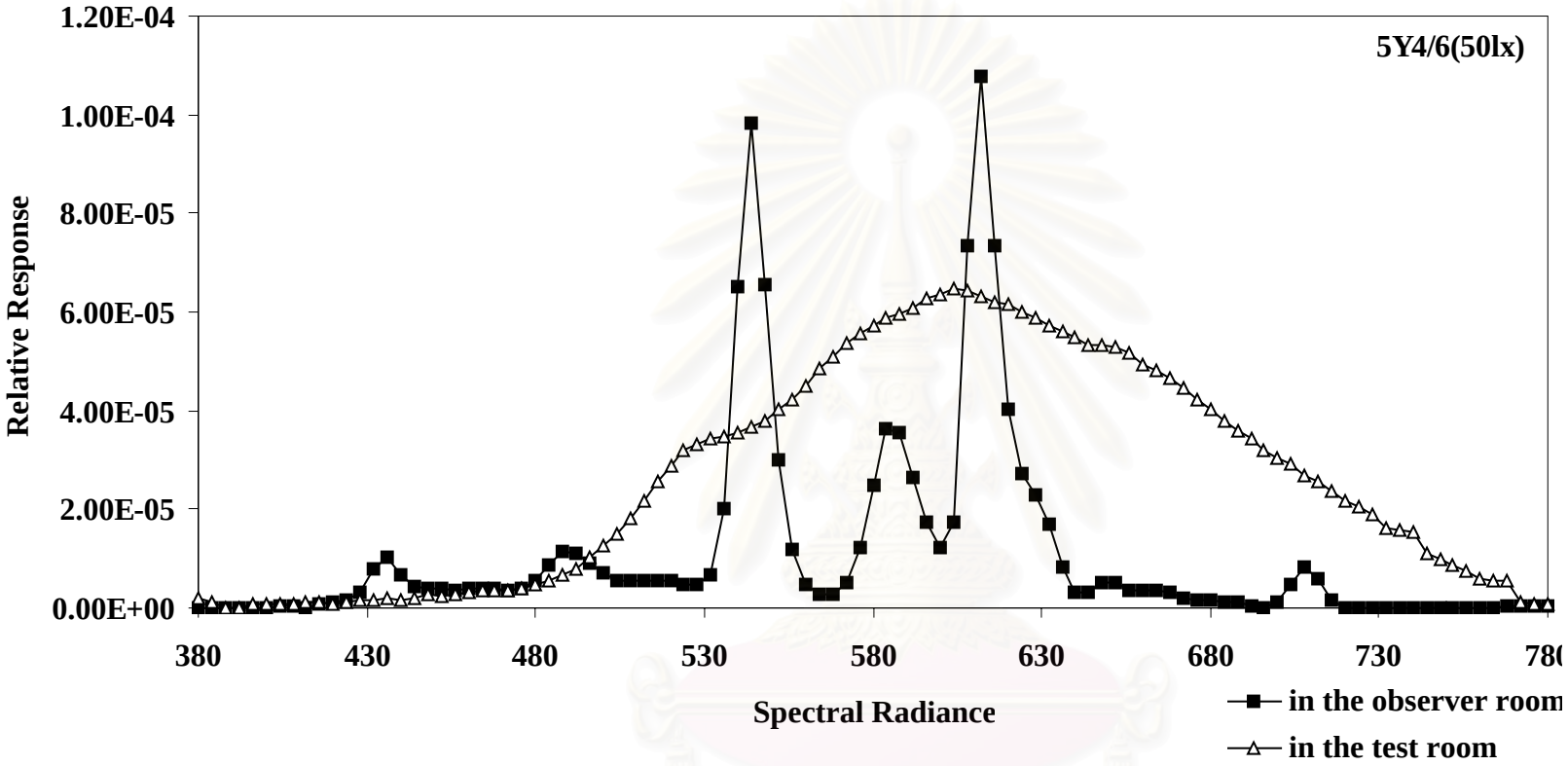


Fig.F-26b Compairison between the spatral of the color chart 5Y4/6 measured at the border of RVSI in the test room and at 50lux in the observer room.

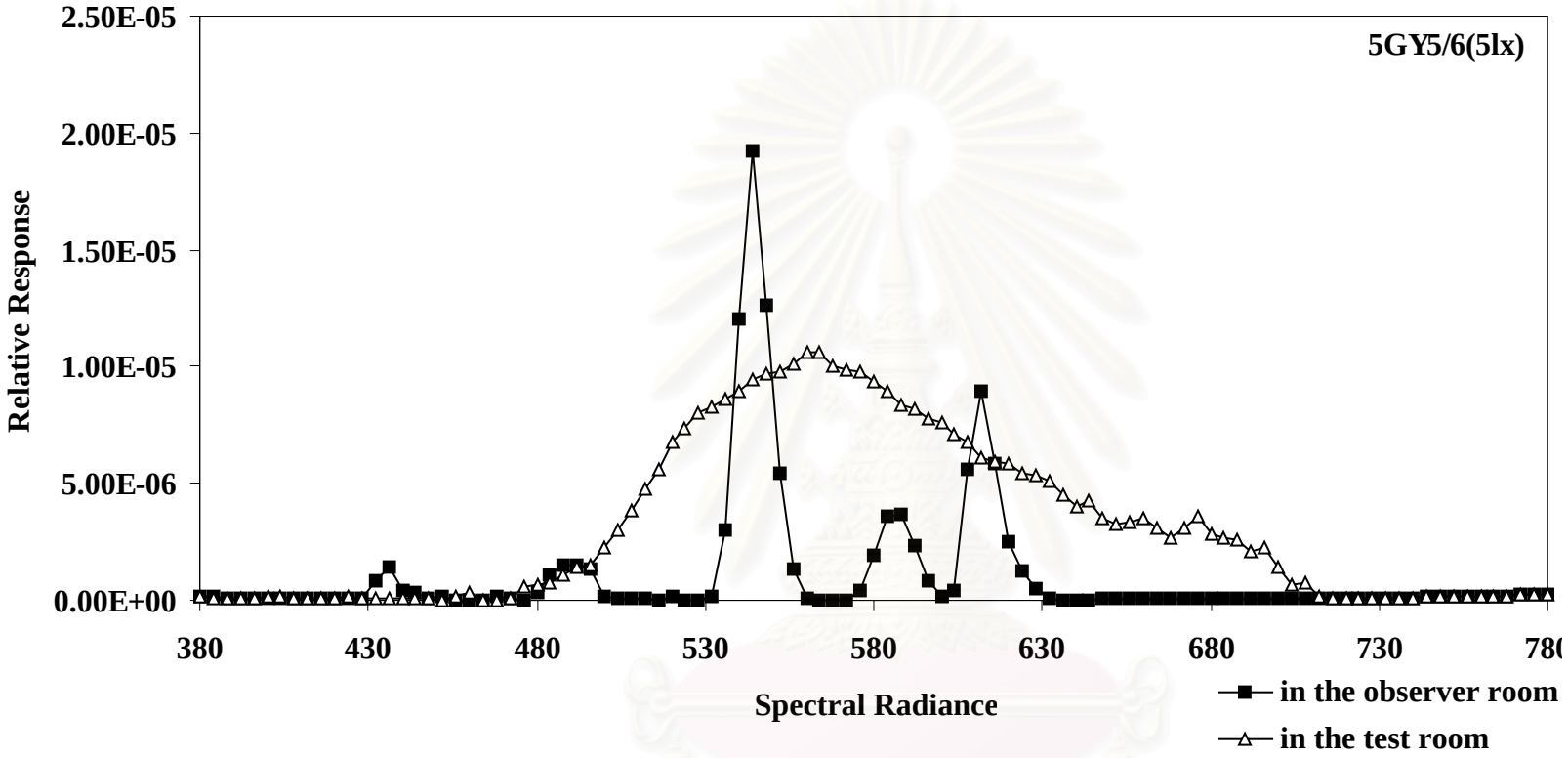


Fig.F-27a Compairison between the spatral of the color chart 5GY5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

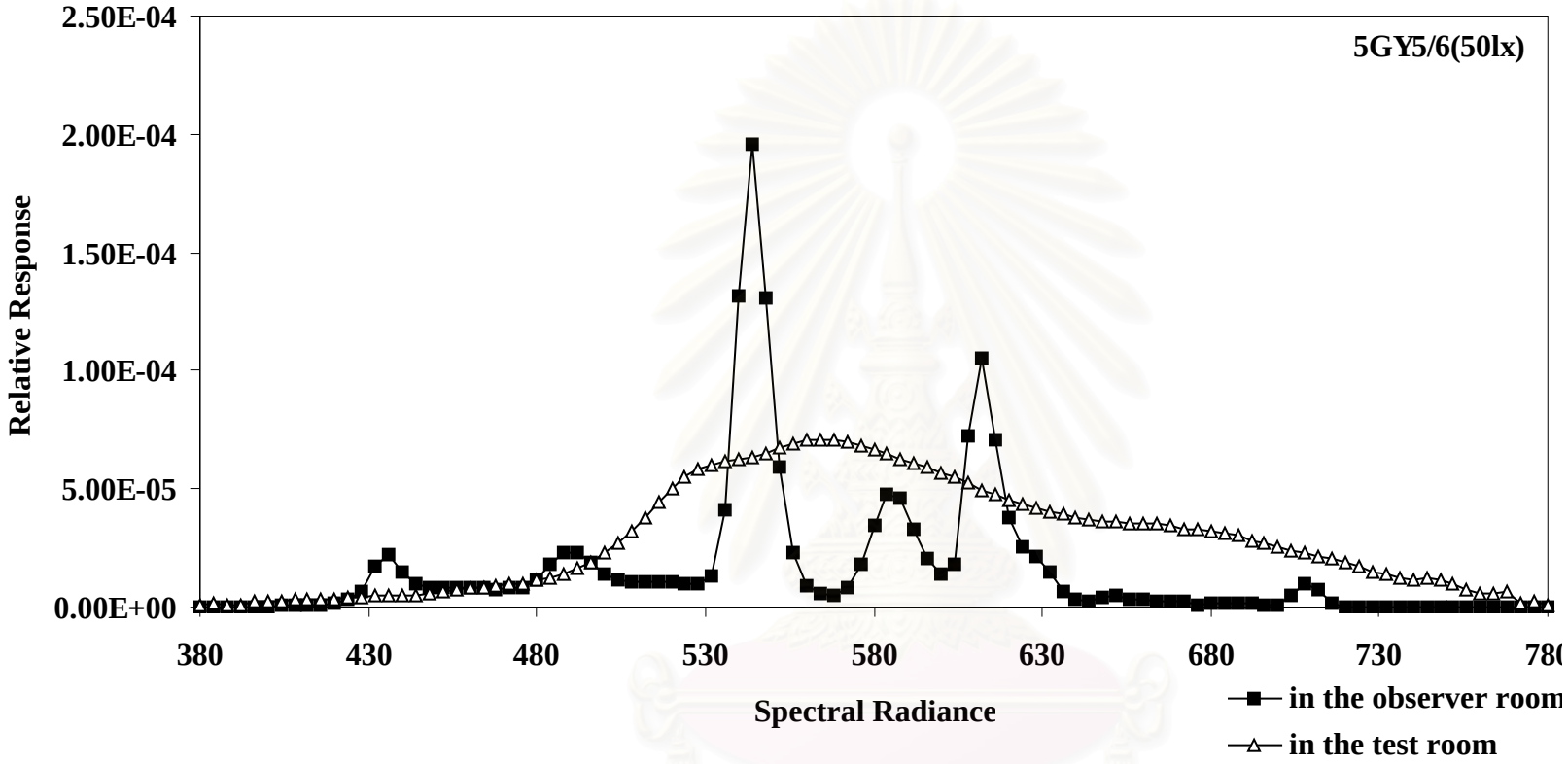


Fig.F-27b Compairison between the spatral of the color chart 5GY5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-28 The spectral distribution data of 5G5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.33E-07		584	2.51E-06	6.19E-06	3.75E-05	4.62E-05
384	1.09E-07	1.09E-07	1.09E-07	1.09E-07		588	2.36E-06	5.71E-06	3.50E-05	4.24E-05
388	9.16E-08	9.16E-08	9.16E-08	1.52E-06		592	1.11E-06	4.86E-06	2.42E-05	3.92E-05
392	7.96E-08	7.96E-08	2.20E-07	2.33E-06		596	1.75E-07	4.30E-06	1.45E-05	3.60E-05
396	7.47E-08	7.47E-08	1.96E-07	3.21E-06		600	3.48E-08	3.69E-06	9.40E-06	3.30E-05
400	2.13E-07	6.86E-08	1.58E-06	3.90E-06		604	1.31E-07	3.32E-06	1.16E-05	3.02E-05
404	3.13E-07	6.21E-08	3.53E-06	4.75E-06		608	2.76E-06	2.76E-06	4.44E-05	2.71E-05
408	5.81E-08	5.81E-08	2.84E-06	5.62E-06		612	5.00E-06	2.65E-06	6.44E-05	2.48E-05
412	5.67E-08	5.67E-08	2.23E-06	6.58E-06		616	2.99E-06	2.12E-06	4.29E-05	2.35E-05
416	1.00E-07	1.00E-07	2.63E-06	6.99E-06		620	7.23E-07	1.78E-06	2.28E-05	2.21E-05
420	6.67E-08	5.77E-08	4.27E-06	7.15E-06		624	6.25E-08	1.54E-06	1.44E-05	2.08E-05
424	2.17E-07	5.01E-08	6.68E-06	8.02E-06		628	3.82E-08	1.01E-06	1.18E-05	1.99E-05
428	4.88E-07	7.64E-08	1.35E-05	8.67E-06		632	3.88E-08	1.05E-06	8.32E-06	1.90E-05
432	2.61E-06	2.40E-07	3.52E-05	1.00E-05		636	3.94E-08	6.78E-07	3.41E-06	1.80E-05
436	3.74E-06	3.93E-07	4.48E-05	1.15E-05		640	4.03E-08	4.83E-07	1.01E-06	1.70E-05
440	2.36E-06	3.77E-07	3.02E-05	1.19E-05		644	4.15E-08	4.05E-07	1.28E-06	1.60E-05
444	1.12E-06	7.42E-07	2.04E-05	1.31E-05		648	4.29E-08	6.35E-07	2.17E-06	1.54E-05
448	9.52E-07	1.07E-06	1.91E-05	1.41E-05		652	4.45E-08	3.53E-07	2.31E-06	1.53E-05
452	1.33E-06	1.01E-06	1.91E-05	1.52E-05		656	4.62E-08	6.58E-07	1.36E-06	1.57E-05
456	1.45E-06	1.33E-06	1.89E-05	1.65E-05		660	4.79E-08	1.56E-07	1.29E-06	1.52E-05
460	1.03E-06	1.73E-06	1.88E-05	1.85E-05		664	4.96E-08	4.96E-08	1.14E-06	1.54E-05
464	9.81E-07	2.07E-06	1.85E-05	2.06E-05		668	5.11E-08	5.11E-08	4.62E-07	1.56E-05
468	9.68E-07	2.26E-06	1.73E-05	2.17E-05		672	5.25E-08	1.57E-07	6.28E-07	1.54E-05
472	1.69E-06	2.73E-06	1.74E-05	2.30E-05		676	5.40E-08	7.79E-08	5.21E-07	1.57E-05
476	1.45E-06	2.87E-06	1.84E-05	2.49E-05		680	5.56E-08	5.56E-08	3.76E-07	1.47E-05
480	1.97E-06	3.19E-06	2.49E-05	2.67E-05		684	5.73E-08	5.73E-08	2.70E-07	1.50E-05
484	3.35E-06	3.49E-06	3.99E-05	2.85E-05		688	5.92E-08	5.92E-08	1.04E-07	1.43E-05
488	4.17E-06	3.98E-06	5.02E-05	3.15E-05		692	6.12E-08	6.12E-08	6.12E-08	1.36E-05
492	3.47E-06	4.77E-06	4.71E-05	3.48E-05		696	6.40E-08	6.40E-08	6.40E-08	1.24E-05
496	2.47E-06	4.97E-06	3.72E-05	3.73E-05		700	6.74E-08	6.74E-08	2.60E-07	1.23E-05
500	1.92E-06	5.44E-06	2.65E-05	4.05E-05		704	7.09E-08	7.09E-08	2.24E-06	1.23E-05
504	1.02E-06	6.10E-06	1.93E-05	4.39E-05		708	7.50E-08	7.50E-08	4.90E-06	1.18E-05
508	5.56E-07	6.86E-06	1.67E-05	4.75E-05		712	8.05E-08	8.05E-08	3.35E-06	9.48E-06
512	5.73E-07	7.54E-06	1.58E-05	5.16E-05		716	8.59E-08	8.59E-08	5.41E-07	9.48E-06
516	4.66E-07	8.42E-06	1.49E-05	5.52E-05		720	9.16E-08	9.16E-08	9.16E-08	8.08E-06
520	4.89E-07	8.62E-06	1.35E-05	5.87E-05		724	9.77E-08	9.77E-08	9.77E-08	7.30E-06
524	3.88E-07	8.98E-06	1.23E-05	6.12E-05		728	1.04E-07	1.04E-07	1.04E-07	6.43E-06
528	2.16E-07	9.06E-06	1.18E-05	6.26E-05		732	1.10E-07	1.10E-07	1.10E-07	6.53E-06
532	2.85E-07	9.32E-06	1.56E-05	6.35E-05		736	1.17E-07	1.17E-07	1.17E-07	5.07E-06
536	3.26E-06	9.81E-06	4.55E-05	6.35E-05		740	1.23E-07	1.23E-07	1.23E-07	5.27E-06
540	1.28E-05	1.01E-05	1.42E-04	6.31E-05		744	1.30E-07	1.30E-07	1.30E-07	5.33E-06
544	2.00E-05	9.81E-06	2.10E-04	6.27E-05		748	1.38E-07	1.38E-07	1.38E-07	4.32E-06
548	1.33E-05	1.00E-05	1.39E-04	6.30E-05		752	1.46E-07	1.46E-07	1.46E-07	2.85E-06
552	5.37E-06	9.95E-06	6.22E-05	6.34E-05		756	1.57E-07	1.57E-07	1.57E-07	2.61E-06
556	1.37E-06	9.97E-06	2.39E-05	6.33E-05		760	1.71E-07	1.71E-07	1.71E-07	2.05E-06
560	1.28E-07	9.81E-06	9.56E-06	6.33E-05		764	1.85E-07	1.85E-07	1.85E-07	3.73E-06
564	3.31E-08	9.48E-06	5.10E-06	6.15E-05		768	2.01E-07	2.01E-07	2.01E-07	3.14E-06
568	3.34E-08	8.69E-06	4.23E-06	5.88E-05		772	2.24E-07	2.24E-07	2.24E-07	2.15E-06
572	3.34E-08	8.30E-06	7.00E-06	5.61E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	4.99E-07	7.90E-06	1.58E-05	5.30E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.65E-06	7.12E-06	2.82E-05	4.94E-05						

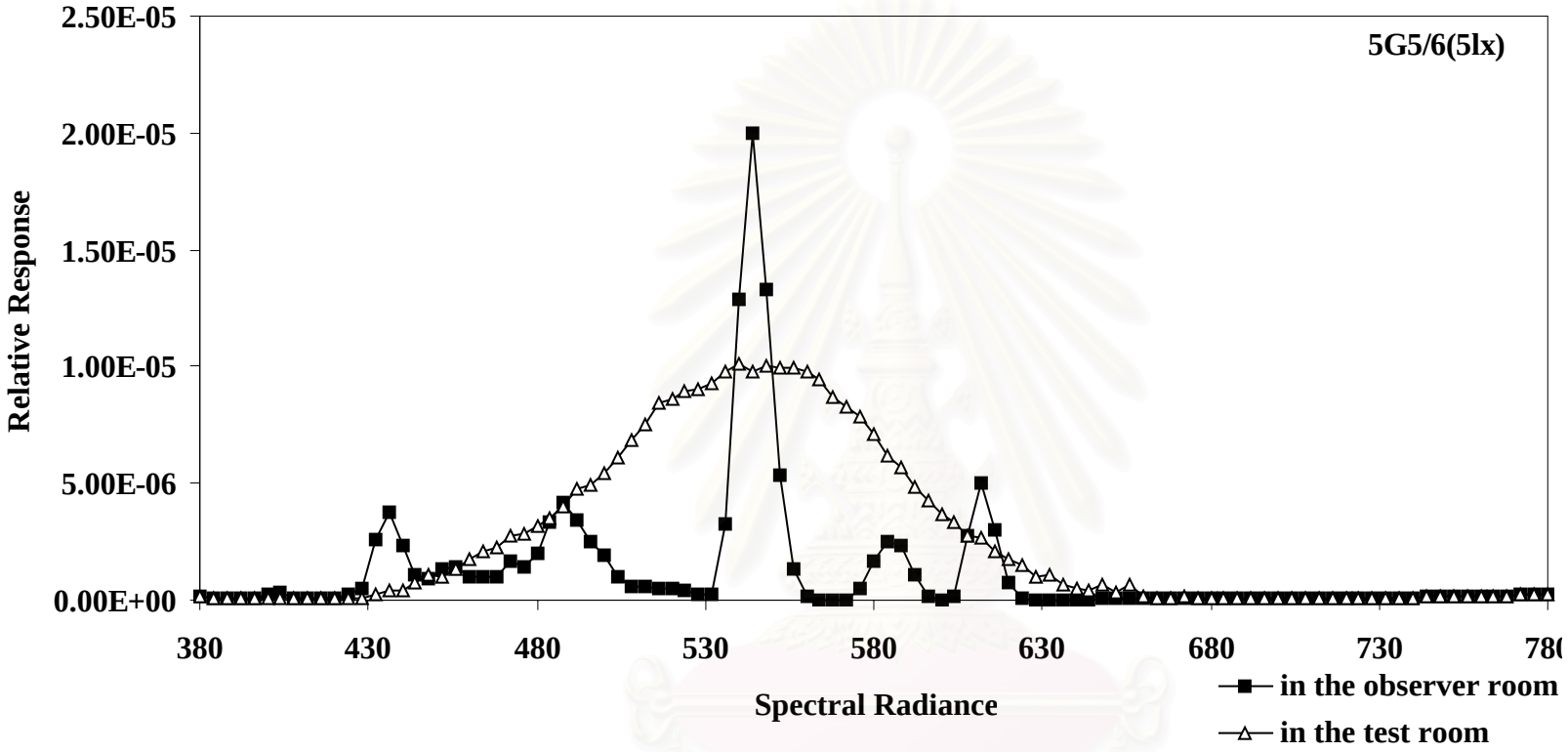


Fig.F-28a Compairison between the spatral of the color chart 5G5/6 measured at the border of RVSI
in the test room and at 5 lux in the observer room

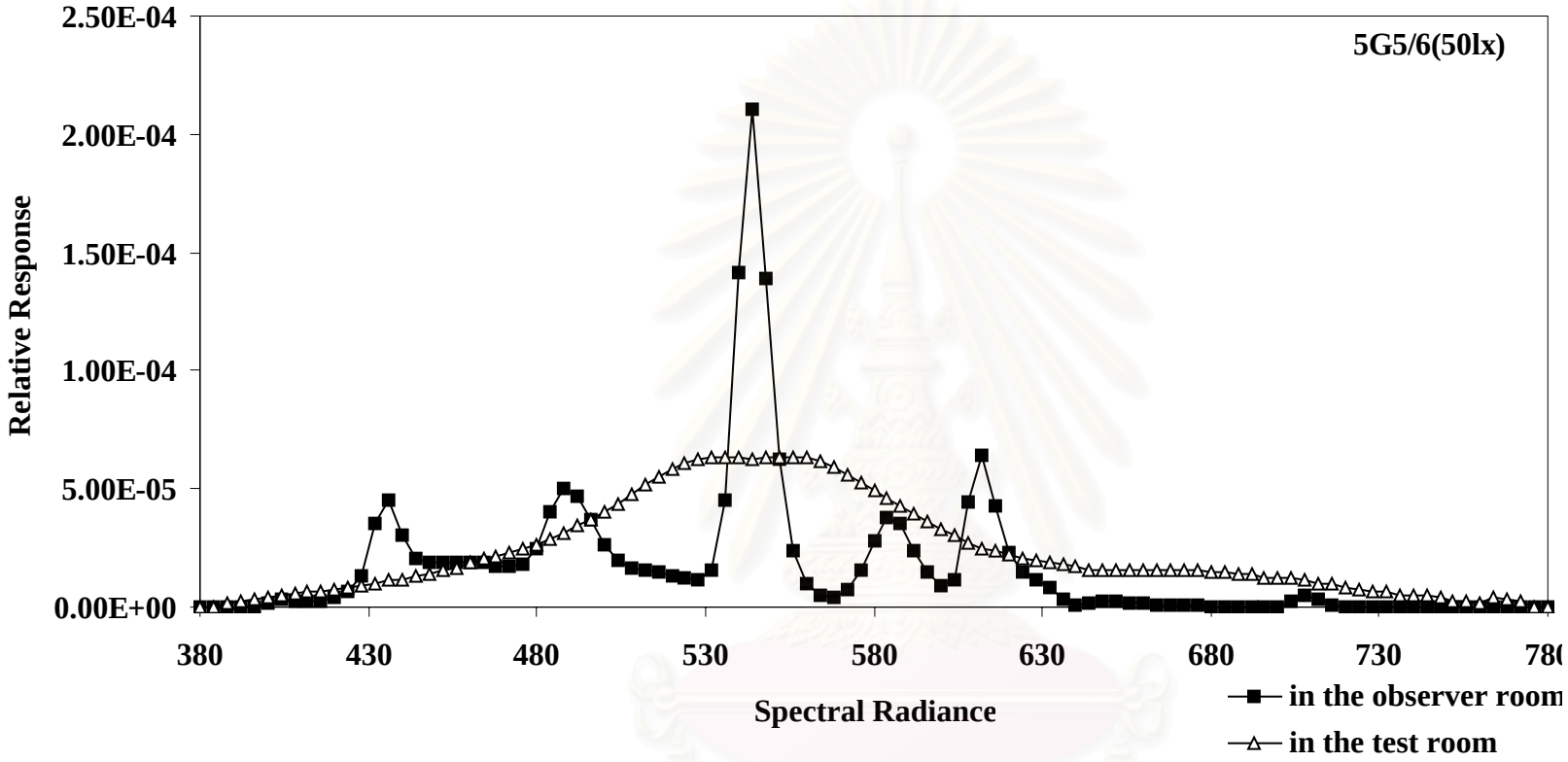


Fig.F-28b Compairison between the spatral of the color chart 5G5/6 measured at the border of RVSI
in the test room and at 50lux in the observer room.

Table F-29 The spectral distribution data of 5BG5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.33E-07		584	2.18E-06	4.99E-06	3.27E-05	3.66E-05
384	1.09E-07	1.09E-07	1.09E-07	7.24E-07		588	2.24E-06	4.35E-06	3.04E-05	3.36E-05
388	9.16E-08	9.16E-08	9.16E-08	2.11E-06		592	1.43E-06	3.86E-06	2.08E-05	3.14E-05
392	9.41E-08	7.96E-08	7.96E-08	2.56E-06		596	3.17E-07	3.35E-06	1.27E-05	2.91E-05
396	2.58E-07	1.15E-07	5.60E-07	3.29E-06		600	3.48E-08	3.08E-06	8.01E-06	2.69E-05
400	6.86E-08	3.36E-07	3.97E-06	4.63E-06		604	1.20E-07	3.04E-06	1.00E-05	2.47E-05
404	4.04E-07	4.61E-07	5.98E-06	5.84E-06		608	2.49E-06	2.41E-06	4.01E-05	2.24E-05
408	4.01E-07	2.43E-07	3.46E-06	7.48E-06		612	4.57E-06	2.15E-06	5.87E-05	2.05E-05
412	5.67E-08	2.08E-07	2.15E-06	8.88E-06		616	2.68E-06	1.71E-06	3.90E-05	1.89E-05
416	5.58E-08	7.21E-07	3.97E-06	8.98E-06		620	6.93E-07	1.57E-06	2.04E-05	1.78E-05
420	5.33E-08	6.81E-07	5.74E-06	1.00E-05		624	6.56E-08	1.12E-06	1.29E-05	1.72E-05
424	1.60E-07	2.85E-07	8.85E-06	1.07E-05		628	3.82E-08	1.33E-06	1.08E-05	1.62E-05
428	1.20E-06	7.57E-07	1.93E-05	1.16E-05		632	3.88E-08	1.07E-06	7.52E-06	1.55E-05
432	3.93E-06	9.16E-07	4.88E-05	1.34E-05		636	3.94E-08	5.81E-07	3.22E-06	1.48E-05
436	5.60E-06	8.99E-07	6.20E-05	1.49E-05		640	4.03E-08	6.29E-07	6.69E-07	1.38E-05
440	3.43E-06	1.31E-06	4.16E-05	1.65E-05		644	4.15E-08	6.14E-08	7.68E-07	1.35E-05
444	1.96E-06	1.45E-06	2.78E-05	1.75E-05		648	4.29E-08	2.35E-07	1.59E-06	1.34E-05
448	1.59E-06	1.32E-06	2.70E-05	1.92E-05		652	4.45E-08	2.53E-07	1.82E-06	1.35E-05
452	1.49E-06	2.12E-06	2.70E-05	2.14E-05		656	4.62E-08	1.26E-07	7.47E-07	1.30E-05
456	1.98E-06	2.94E-06	2.69E-05	2.37E-05		660	4.79E-08	1.34E-07	1.08E-06	1.29E-05
460	1.78E-06	3.53E-06	2.67E-05	2.59E-05		664	4.96E-08	4.96E-08	1.06E-06	1.25E-05
464	1.68E-06	3.73E-06	2.65E-05	2.83E-05		668	5.11E-08	5.11E-08	8.20E-07	1.24E-05
468	1.74E-06	4.12E-06	2.64E-05	3.06E-05		672	5.25E-08	5.25E-08	4.05E-07	1.29E-05
472	2.02E-06	4.54E-06	2.60E-05	3.27E-05		676	5.40E-08	5.40E-08	3.03E-07	1.28E-05
476	1.98E-06	4.63E-06	2.71E-05	3.47E-05		680	5.56E-08	5.56E-08	2.23E-07	1.24E-05
480	2.74E-06	4.98E-06	3.64E-05	3.73E-05		684	5.73E-08	5.73E-08	1.56E-07	1.16E-05
484	4.95E-06	5.50E-06	5.69E-05	4.03E-05		688	5.92E-08	5.92E-08	5.92E-08	1.17E-05
488	6.57E-06	6.24E-06	7.01E-05	4.29E-05		692	6.12E-08	6.12E-08	6.12E-08	1.14E-05
492	5.89E-06	6.42E-06	6.42E-05	4.56E-05		696	6.40E-08	6.40E-08	6.40E-08	1.03E-05
496	4.17E-06	6.79E-06	4.94E-05	4.73E-05		700	6.74E-08	6.74E-08	6.74E-08	9.46E-06
500	2.54E-06	6.95E-06	3.30E-05	4.85E-05		704	7.09E-08	7.09E-08	1.92E-06	9.18E-06
504	1.64E-06	7.29E-06	2.31E-05	4.94E-05		708	7.50E-08	7.50E-08	4.31E-06	8.92E-06
508	9.86E-07	7.48E-06	1.88E-05	5.05E-05		712	8.05E-08	8.05E-08	2.62E-06	7.18E-06
512	4.81E-07	7.59E-06	1.72E-05	5.19E-05		716	8.59E-08	8.59E-08	4.40E-07	6.13E-06
516	3.26E-07	7.90E-06	1.56E-05	5.38E-05		720	9.16E-08	9.16E-08	9.16E-08	5.37E-06
520	4.31E-07	8.10E-06	1.35E-05	5.48E-05		724	9.77E-08	9.77E-08	9.77E-08	5.18E-06
524	3.94E-07	8.49E-06	1.18E-05	5.62E-05		728	1.04E-07	1.04E-07	1.04E-07	4.86E-06
528	3.43E-08	8.48E-06	1.12E-05	5.69E-05		732	1.10E-07	1.10E-07	1.10E-07	4.34E-06
532	4.19E-07	8.62E-06	1.47E-05	5.69E-05		736	1.17E-07	1.17E-07	1.17E-07	3.23E-06
536	3.36E-06	8.71E-06	4.24E-05	5.63E-05		740	1.23E-07	1.23E-07	1.23E-07	2.29E-06
540	1.25E-05	8.72E-06	1.33E-04	5.55E-05		744	1.30E-07	1.30E-07	1.30E-07	3.45E-06
544	1.92E-05	8.41E-06	1.96E-04	5.47E-05		748	1.38E-07	1.38E-07	1.38E-07	2.55E-06
548	1.23E-05	8.47E-06	1.28E-04	5.42E-05		752	1.46E-07	1.46E-07	1.46E-07	1.67E-06
552	5.08E-06	8.72E-06	5.71E-05	5.40E-05		756	1.57E-07	1.57E-07	1.57E-07	1.23E-06
556	1.27E-06	8.53E-06	2.18E-05	5.32E-05		760	1.71E-07	1.71E-07	1.71E-07	1.40E-06
560	1.11E-07	8.41E-06	8.33E-06	5.21E-05		764	1.85E-07	1.85E-07	1.85E-07	3.92E-07
564	3.31E-08	7.38E-06	4.39E-06	4.98E-05		768	2.01E-07	2.01E-07	2.01E-07	2.90E-07
568	3.34E-08	7.05E-06	3.98E-06	4.75E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	6.52E-06	5.87E-06	4.51E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	2.66E-07	5.84E-06	1.35E-05	4.22E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.27E-06	5.31E-06	2.45E-05	3.94E-05						

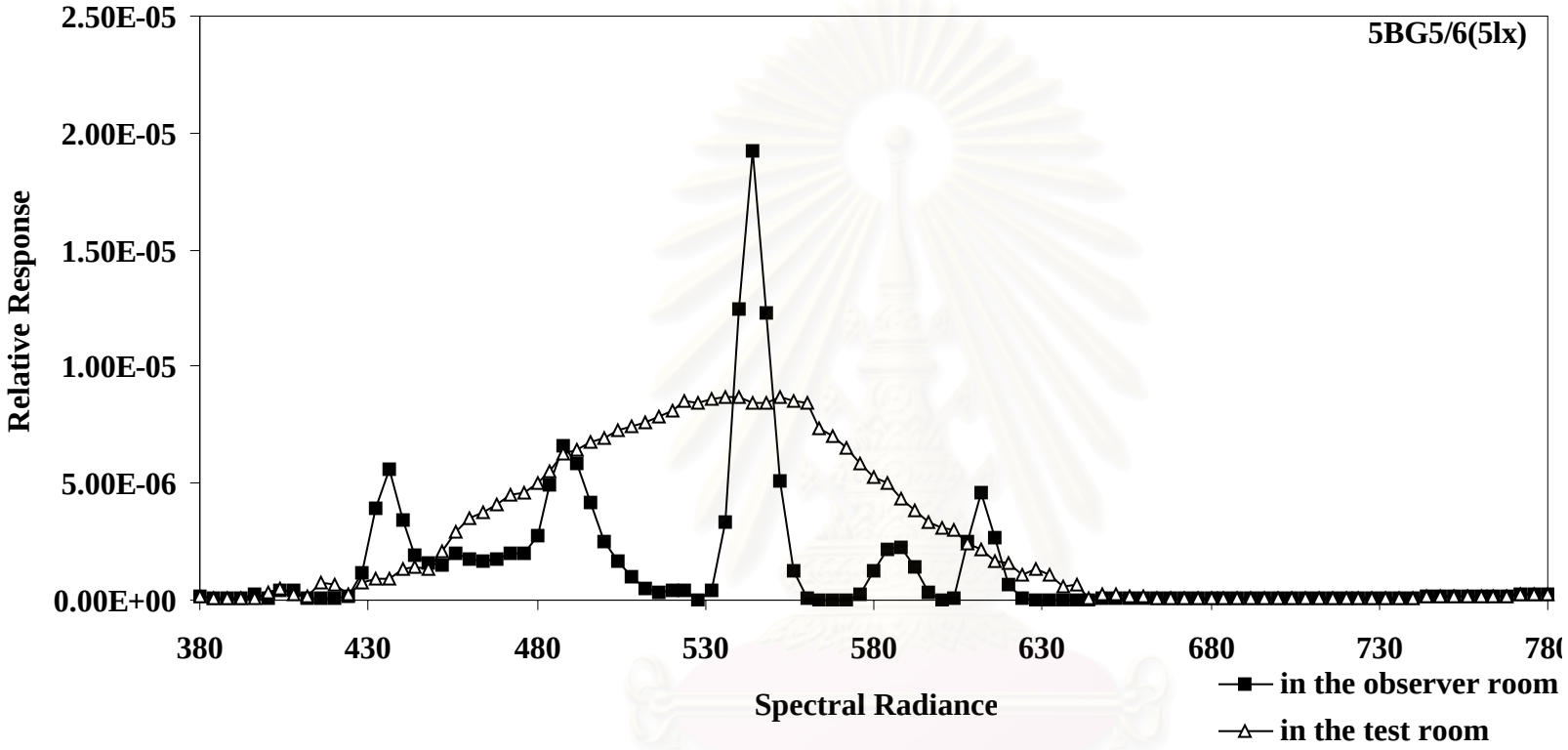


Fig.F-29a Compairison between the spatral of the color chart 5BG5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

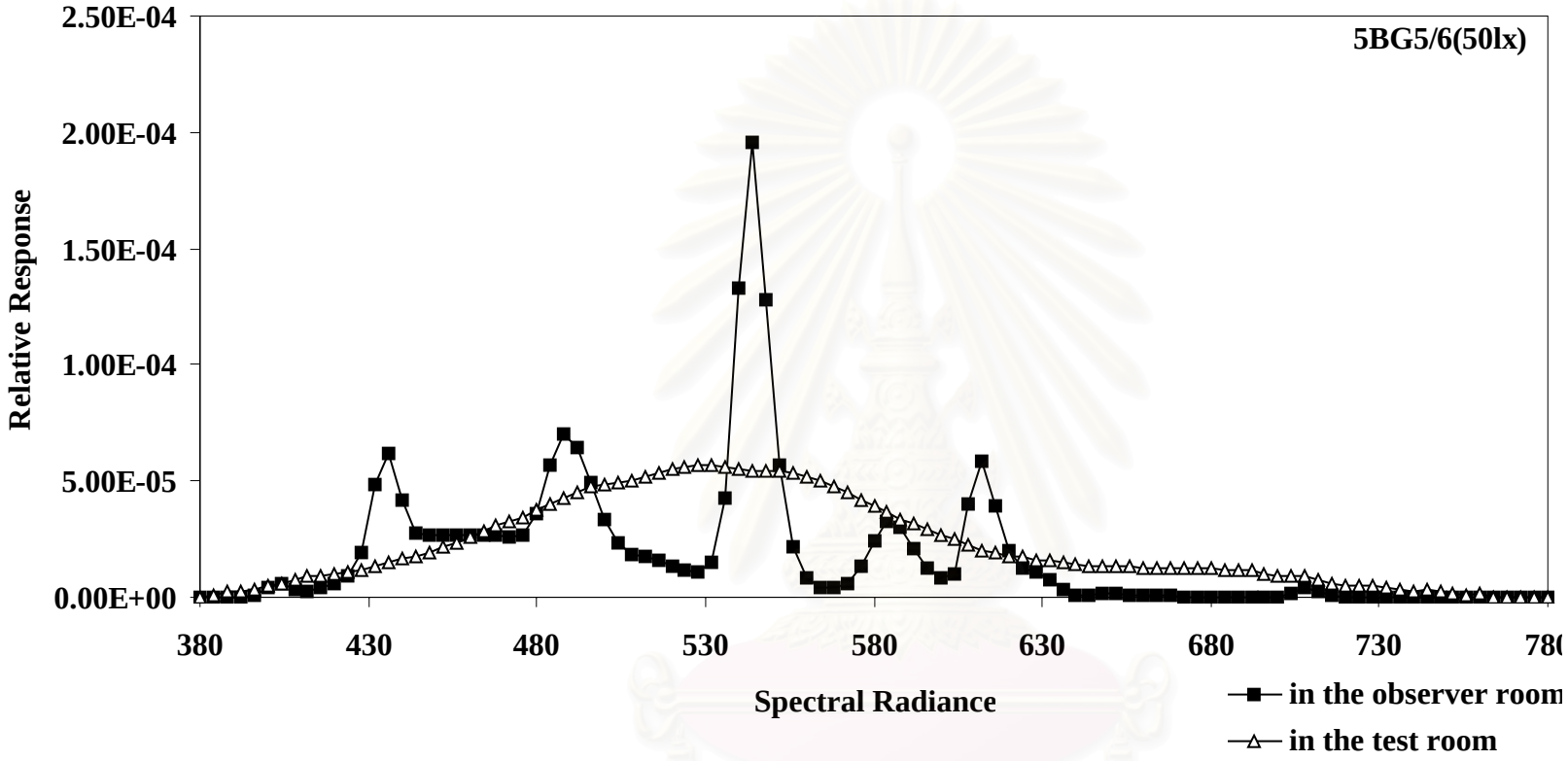


Fig.F-29b Compairison between the spatral of the color chart 5BG5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-30 The spectral distribution data of 5B5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	4.46E-07	1.54E-06		584	1.82E-06	4.68E-06	2.90E-05	3.58E-05
384	1.09E-07	1.09E-07	1.08E-06	1.92E-06		588	1.69E-06	4.47E-06	2.74E-05	3.41E-05
388	9.16E-08	9.16E-08	9.48E-07	3.14E-06		592	6.07E-07	4.42E-06	1.97E-05	3.33E-05
392	7.96E-08	7.96E-08	4.02E-07	5.66E-06		596	1.15E-07	4.14E-06	1.25E-05	3.23E-05
396	7.47E-08	7.47E-08	8.03E-07	7.18E-06		600	4.50E-08	3.95E-06	8.47E-06	3.13E-05
400	6.86E-08	3.79E-07	5.61E-06	9.56E-06		604	4.44E-07	3.61E-06	1.10E-05	3.01E-05
404	2.20E-07	1.34E-06	9.02E-06	1.21E-05		608	3.09E-06	3.14E-06	4.62E-05	2.89E-05
408	2.17E-07	1.27E-06	6.73E-06	1.45E-05		612	5.31E-06	2.79E-06	6.78E-05	2.75E-05
412	5.67E-08	1.32E-06	4.72E-06	1.68E-05		616	3.44E-06	2.86E-06	4.56E-05	2.65E-05
416	5.58E-08	1.37E-06	5.88E-06	1.82E-05		620	1.48E-06	2.90E-06	2.48E-05	2.62E-05
420	2.20E-07	9.28E-07	9.63E-06	1.91E-05		624	1.34E-07	2.91E-06	1.66E-05	2.54E-05
424	7.53E-07	1.71E-06	1.47E-05	2.02E-05		628	3.82E-08	2.27E-06	1.42E-05	2.45E-05
428	2.29E-06	1.87E-06	3.00E-05	2.28E-05		632	3.88E-08	2.25E-06	9.79E-06	2.39E-05
432	6.90E-06	2.70E-06	7.51E-05	2.50E-05		636	3.94E-08	1.99E-06	4.44E-06	2.34E-05
436	8.72E-06	2.90E-06	9.50E-05	2.68E-05		640	4.03E-08	2.08E-06	1.71E-06	2.29E-05
440	5.22E-06	2.81E-06	6.34E-05	2.85E-05		644	4.15E-08	1.76E-06	1.58E-06	2.25E-05
444	3.57E-06	3.40E-06	4.18E-05	3.06E-05		648	4.29E-08	1.69E-06	2.61E-06	2.28E-05
448	2.85E-06	3.54E-06	3.83E-05	3.23E-05		652	4.45E-08	1.88E-06	2.59E-06	2.31E-05
452	2.86E-06	3.93E-06	3.84E-05	3.47E-05		656	4.62E-08	1.97E-06	1.84E-06	2.26E-05
456	2.94E-06	4.75E-06	3.74E-05	3.75E-05		660	4.79E-08	1.83E-06	2.40E-06	2.25E-05
460	2.76E-06	5.47E-06	3.59E-05	4.01E-05		664	4.96E-08	1.76E-06	2.69E-06	2.25E-05
464	2.64E-06	6.18E-06	3.46E-05	4.23E-05		668	5.11E-08	1.54E-06	1.95E-06	2.18E-05
468	2.46E-06	6.39E-06	3.33E-05	4.43E-05		672	5.25E-08	1.02E-06	9.99E-07	2.07E-05
472	2.18E-06	6.81E-06	3.17E-05	4.60E-05		676	5.40E-08	1.07E-06	4.93E-07	2.01E-05
476	2.74E-06	6.85E-06	3.20E-05	4.74E-05		680	5.56E-08	5.76E-07	4.42E-07	1.86E-05
480	3.23E-06	7.26E-06	4.17E-05	4.94E-05		684	5.73E-08	2.37E-07	7.29E-07	1.73E-05
484	5.77E-06	7.52E-06	6.43E-05	5.21E-05		688	5.92E-08	1.04E-07	7.03E-07	1.55E-05
488	7.62E-06	7.86E-06	7.86E-05	5.49E-05		692	6.12E-08	6.12E-08	2.11E-07	1.39E-05
492	6.61E-06	7.91E-06	7.14E-05	5.73E-05		696	6.40E-08	6.40E-08	6.40E-08	1.20E-05
496	4.25E-06	8.27E-06	5.42E-05	5.84E-05		700	6.74E-08	6.74E-08	6.74E-08	1.12E-05
500	2.50E-06	8.88E-06	3.62E-05	5.90E-05		704	7.09E-08	7.09E-08	1.40E-06	9.54E-06
504	1.91E-06	8.55E-06	2.50E-05	5.94E-05		708	7.50E-08	7.50E-08	3.84E-06	8.35E-06
508	9.48E-07	8.53E-06	2.00E-05	6.02E-05		712	8.05E-08	8.05E-08	2.96E-06	7.67E-06
512	9.10E-07	8.95E-06	1.77E-05	6.09E-05		716	8.59E-08	8.59E-08	8.96E-07	6.91E-06
516	8.21E-07	9.21E-06	1.59E-05	6.24E-05		720	9.16E-08	9.16E-08	9.16E-08	5.83E-06
520	1.24E-07	9.48E-06	1.42E-05	6.36E-05		724	9.77E-08	9.77E-08	9.77E-08	5.61E-06
524	2.55E-07	9.48E-06	1.20E-05	6.42E-05		728	1.04E-07	1.04E-07	1.04E-07	4.63E-06
528	3.43E-08	9.49E-06	1.13E-05	6.41E-05		732	1.10E-07	1.10E-07	1.10E-07	5.02E-06
532	3.69E-07	9.75E-06	1.44E-05	6.32E-05		736	1.17E-07	1.17E-07	1.17E-07	4.34E-06
536	3.00E-06	9.60E-06	4.06E-05	6.14E-05		740	1.23E-07	1.23E-07	1.23E-07	4.56E-06
540	1.16E-05	9.31E-06	1.26E-04	5.96E-05		744	1.30E-07	1.30E-07	1.30E-07	5.08E-06
544	1.81E-05	9.13E-06	1.85E-04	5.76E-05		748	1.38E-07	1.38E-07	1.38E-07	4.13E-06
548	1.16E-05	9.01E-06	1.20E-04	5.63E-05		752	1.46E-07	1.46E-07	1.46E-07	4.55E-06
552	4.49E-06	8.75E-06	5.24E-05	5.47E-05		756	1.57E-07	1.57E-07	1.57E-07	4.96E-06
556	9.31E-07	8.20E-06	1.96E-05	5.28E-05		760	1.71E-07	1.71E-07	1.71E-07	3.05E-06
560	5.01E-08	7.95E-06	7.38E-06	5.06E-05		764	1.85E-07	1.85E-07	1.85E-07	2.47E-06
564	3.31E-08	7.29E-06	3.72E-06	4.79E-05		768	2.01E-07	2.01E-07	2.01E-07	1.81E-06
568	3.34E-08	6.27E-06	3.13E-06	4.47E-05		772	2.24E-07	2.24E-07	2.24E-07	2.27E-07
572	3.34E-08	5.93E-06	4.98E-06	4.20E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	1.59E-07	5.44E-06	1.15E-05	3.95E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	7.02E-07	5.15E-06	2.12E-05	3.73E-05						

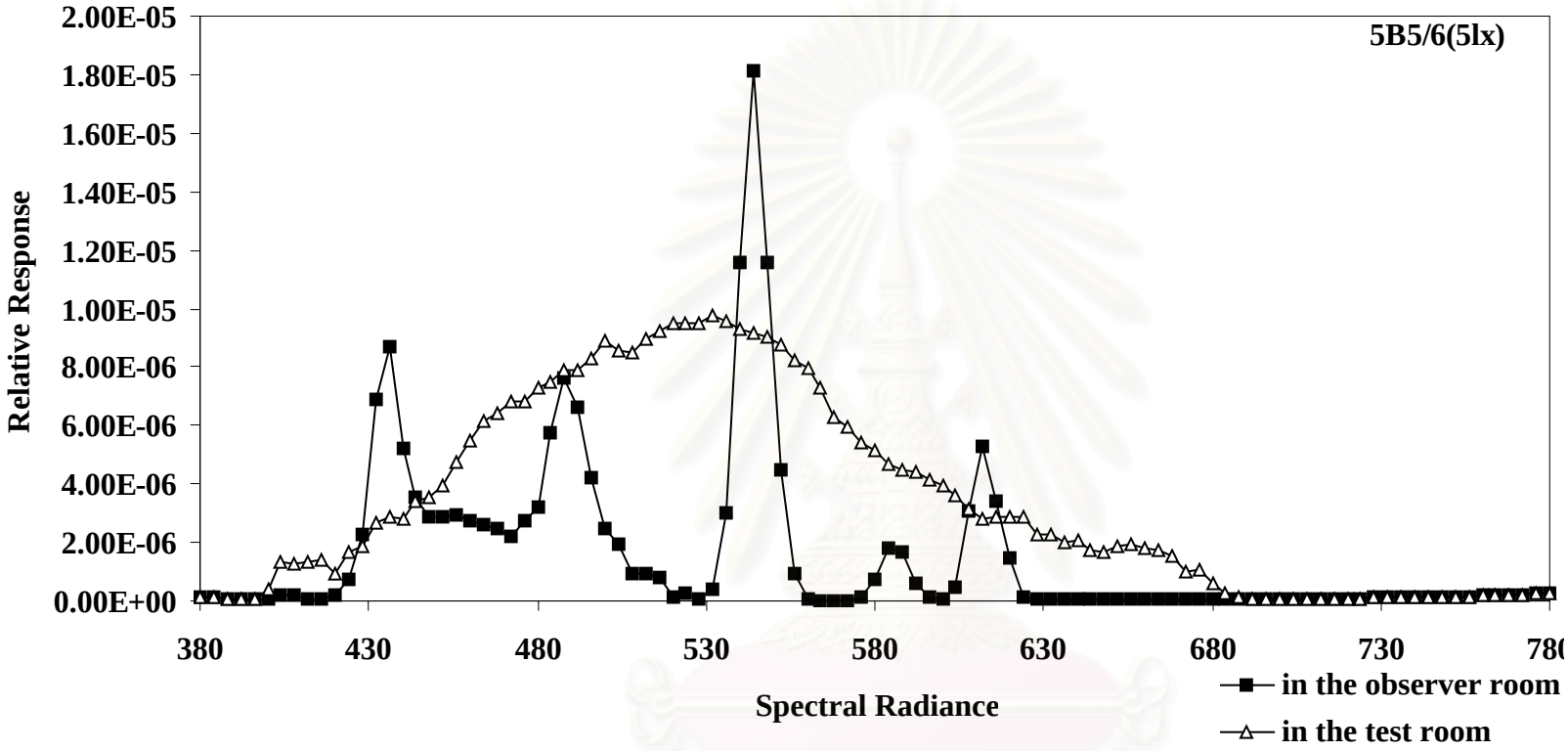


Fig.F-30a Compairison between the spatral of the color chart 5B5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

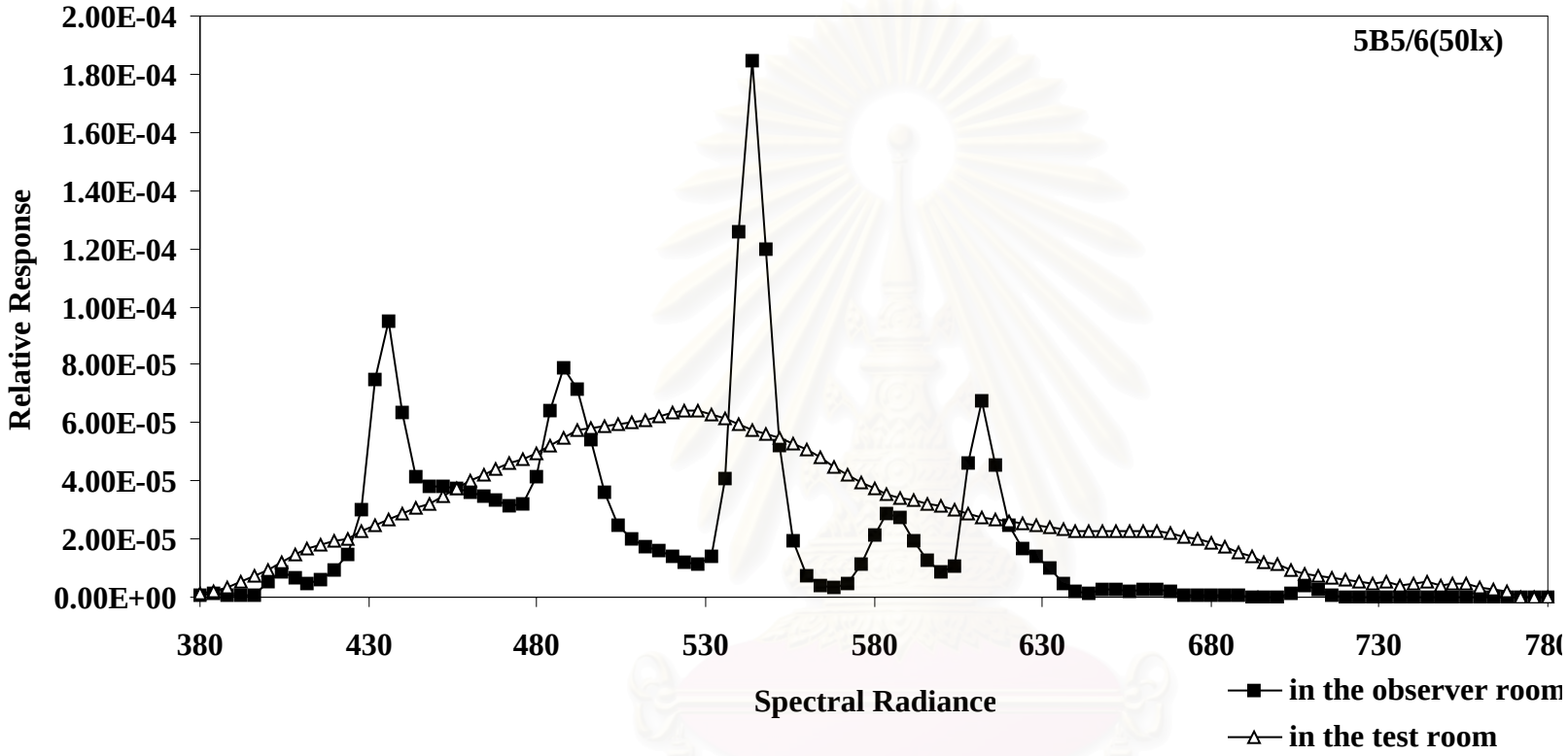


Fig.F-30b Compairison between the spatral of the color chart 5B5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-31 The spectral distribution data of 5PB5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.11E-07	1.33E-07	1.40E-06		584	2.81E-06	7.39E-06	3.81E-05	5.12E-05
384	1.09E-07	1.41E-07	1.09E-07	2.26E-06		588	2.76E-06	7.70E-06	3.73E-05	5.11E-05
388	9.16E-08	9.16E-08	9.16E-08	3.93E-06		592	1.68E-06	7.58E-06	2.75E-05	5.17E-05
392	7.96E-08	7.96E-08	7.96E-08	7.16E-06		596	5.34E-07	7.47E-06	1.83E-05	5.21E-05
396	7.47E-08	7.47E-08	8.44E-07	1.01E-05		600	1.10E-07	7.27E-06	1.27E-05	5.21E-05
400	1.51E-07	2.75E-07	6.71E-06	1.26E-05		604	2.56E-07	7.12E-06	1.68E-05	5.13E-05
404	2.32E-07	9.72E-07	1.13E-05	1.55E-05		608	5.67E-06	6.81E-06	6.90E-05	4.97E-05
408	8.45E-08	1.53E-06	8.07E-06	1.82E-05		612	8.94E-06	6.33E-06	1.01E-04	4.79E-05
412	5.67E-08	1.62E-06	5.97E-06	2.14E-05		616	5.58E-06	6.61E-06	6.81E-05	4.71E-05
416	2.33E-07	1.83E-06	7.46E-06	2.35E-05		620	2.58E-06	6.13E-06	3.72E-05	4.61E-05
420	7.06E-07	2.18E-06	1.13E-05	2.53E-05		624	1.07E-06	5.59E-06	2.52E-05	4.51E-05
424	7.44E-07	2.67E-06	1.79E-05	2.69E-05		628	5.52E-07	5.76E-06	2.14E-05	4.34E-05
428	2.13E-06	2.93E-06	3.64E-05	2.94E-05		632	2.94E-07	5.78E-06	1.56E-05	4.25E-05
432	7.57E-06	3.37E-06	9.07E-05	3.28E-05		636	3.94E-08	5.50E-06	7.27E-06	4.23E-05
436	9.95E-06	4.06E-06	1.15E-04	3.52E-05		640	4.03E-08	5.14E-06	3.35E-06	4.25E-05
440	6.62E-06	4.02E-06	7.63E-05	3.73E-05		644	4.15E-08	5.39E-06	3.31E-06	4.23E-05
444	4.35E-06	4.66E-06	4.98E-05	3.87E-05		648	4.29E-08	5.25E-06	5.20E-06	4.32E-05
448	4.06E-06	4.92E-06	4.54E-05	4.05E-05		652	4.45E-08	5.13E-06	5.07E-06	4.41E-05
452	3.82E-06	5.33E-06	4.44E-05	4.31E-05		656	4.62E-08	5.72E-06	3.96E-06	4.47E-05
456	3.73E-06	6.37E-06	4.25E-05	4.57E-05		660	4.79E-08	5.65E-06	3.94E-06	4.49E-05
460	3.45E-06	6.98E-06	4.04E-05	4.85E-05		664	4.96E-08	5.35E-06	4.15E-06	4.44E-05
464	3.05E-06	7.43E-06	3.84E-05	5.05E-05		668	5.11E-08	5.27E-06	3.62E-06	4.34E-05
468	3.06E-06	7.79E-06	3.59E-05	5.19E-05		672	5.25E-08	4.95E-06	2.23E-06	4.21E-05
472	2.78E-06	7.56E-06	3.41E-05	5.30E-05		676	5.40E-08	4.80E-06	1.21E-06	4.02E-05
476	2.44E-06	7.44E-06	3.42E-05	5.35E-05		680	5.56E-08	4.33E-06	1.83E-06	3.77E-05
480	3.54E-06	7.96E-06	4.35E-05	5.47E-05		684	5.73E-08	4.19E-06	2.01E-06	3.53E-05
484	5.85E-06	8.22E-06	6.51E-05	5.61E-05		688	5.92E-08	3.84E-06	1.96E-06	3.26E-05
488	7.13E-06	8.23E-06	7.79E-05	5.76E-05		692	6.12E-08	3.41E-06	1.04E-06	2.98E-05
492	6.49E-06	8.39E-06	6.92E-05	5.84E-05		696	6.40E-08	3.20E-06	1.15E-07	2.69E-05
496	4.63E-06	8.24E-06	5.12E-05	5.81E-05		700	6.74E-08	2.19E-06	4.80E-07	2.47E-05
500	2.77E-06	7.92E-06	3.25E-05	5.68E-05		704	7.09E-08	1.75E-06	3.71E-06	2.20E-05
504	1.90E-06	7.80E-06	2.23E-05	5.60E-05		708	7.50E-08	3.80E-07	8.76E-06	2.04E-05
508	1.27E-06	7.73E-06	1.77E-05	5.46E-05		712	8.05E-08	8.05E-08	6.70E-06	1.80E-05
512	5.05E-07	7.67E-06	1.51E-05	5.38E-05		716	8.59E-08	8.59E-08	1.81E-06	1.78E-05
516	1.13E-07	7.56E-06	1.32E-05	5.35E-05		720	9.16E-08	9.16E-08	9.16E-08	1.67E-05
520	3.36E-08	7.91E-06	1.11E-05	5.37E-05		724	9.77E-08	9.77E-08	9.77E-08	1.67E-05
524	3.39E-08	7.62E-06	9.92E-06	5.34E-05		728	1.04E-07	1.04E-07	1.04E-07	1.54E-05
528	9.17E-08	7.60E-06	9.14E-06	5.36E-05		732	1.10E-07	1.10E-07	1.10E-07	1.44E-05
532	4.23E-07	7.59E-06	1.21E-05	5.34E-05		736	1.17E-07	1.17E-07	1.17E-07	1.55E-05
536	2.58E-06	7.92E-06	3.48E-05	5.32E-05		740	1.23E-07	1.23E-07	1.23E-07	1.33E-05
540	9.99E-06	7.96E-06	1.09E-04	5.33E-05		744	1.30E-07	1.30E-07	1.30E-07	1.39E-05
544	1.55E-05	7.89E-06	1.62E-04	5.37E-05		748	1.38E-07	1.38E-07	1.38E-07	1.38E-05
548	1.03E-05	8.21E-06	1.08E-04	5.49E-05		752	1.46E-07	1.46E-07	1.46E-07	1.43E-05
552	4.11E-06	8.64E-06	4.92E-05	5.59E-05		756	1.57E-07	1.57E-07	1.57E-07	1.32E-05
556	1.03E-06	8.69E-06	1.92E-05	5.60E-05		760	1.71E-07	1.71E-07	1.71E-07	1.20E-05
560	2.42E-07	8.52E-06	8.04E-06	5.55E-05		764	1.85E-07	1.85E-07	1.85E-07	9.98E-06
564	4.73E-08	8.44E-06	4.58E-06	5.43E-05		768	2.01E-07	2.01E-07	2.01E-07	7.56E-06
568	3.34E-08	7.93E-06	3.73E-06	5.32E-05		772	2.24E-07	2.24E-07	2.24E-07	7.59E-06
572	3.34E-08	7.38E-06	5.89E-06	5.25E-05		776	2.47E-07	2.47E-07	2.47E-07	6.55E-06
576	6.24E-07	7.56E-06	1.44E-05	5.20E-05		780	2.77E-07	2.77E-07	2.77E-07	2.99E-06
580	1.97E-06	7.37E-06	2.69E-05	5.17E-05						

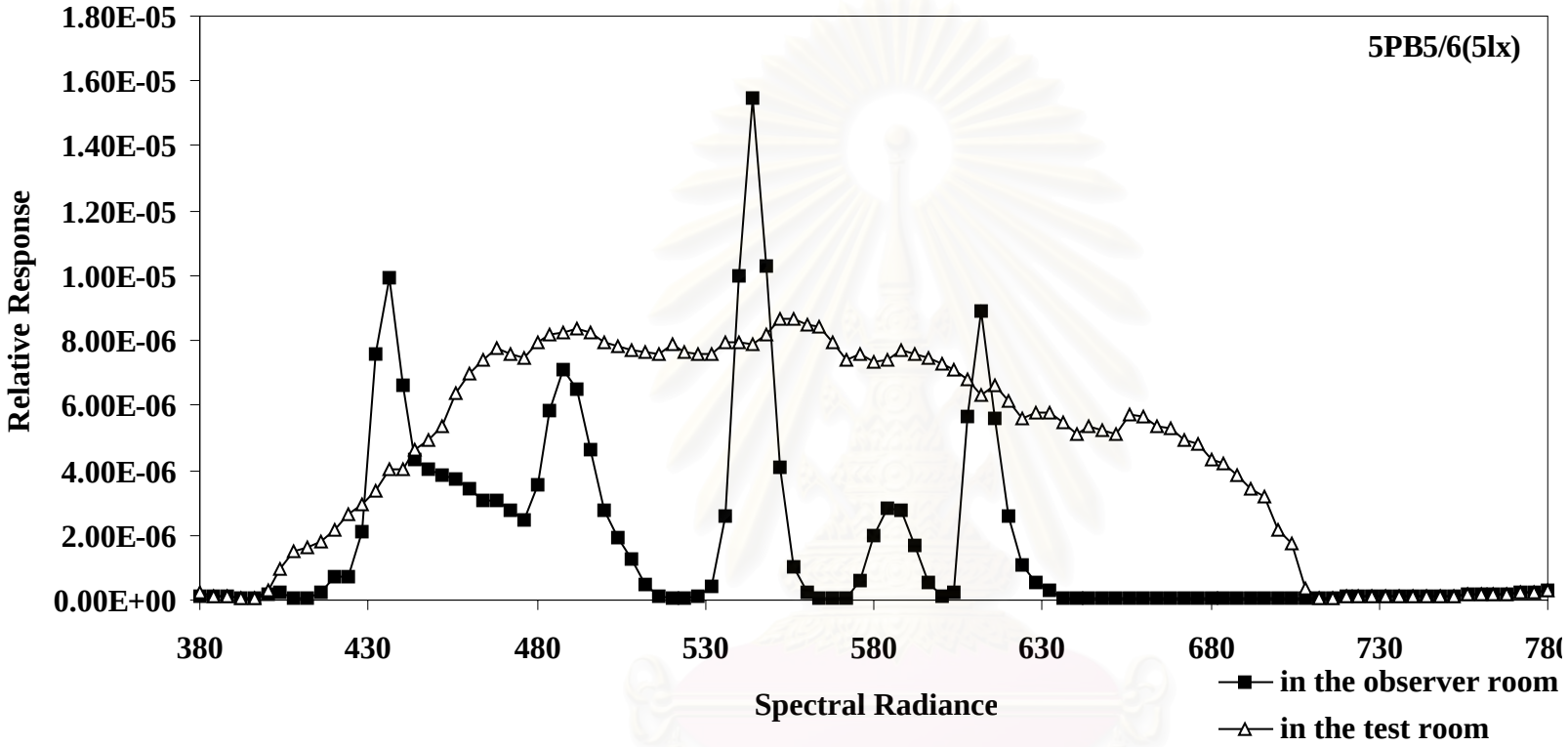


Fig.F-31a Compairison between the spatral of the color chart 5PB5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

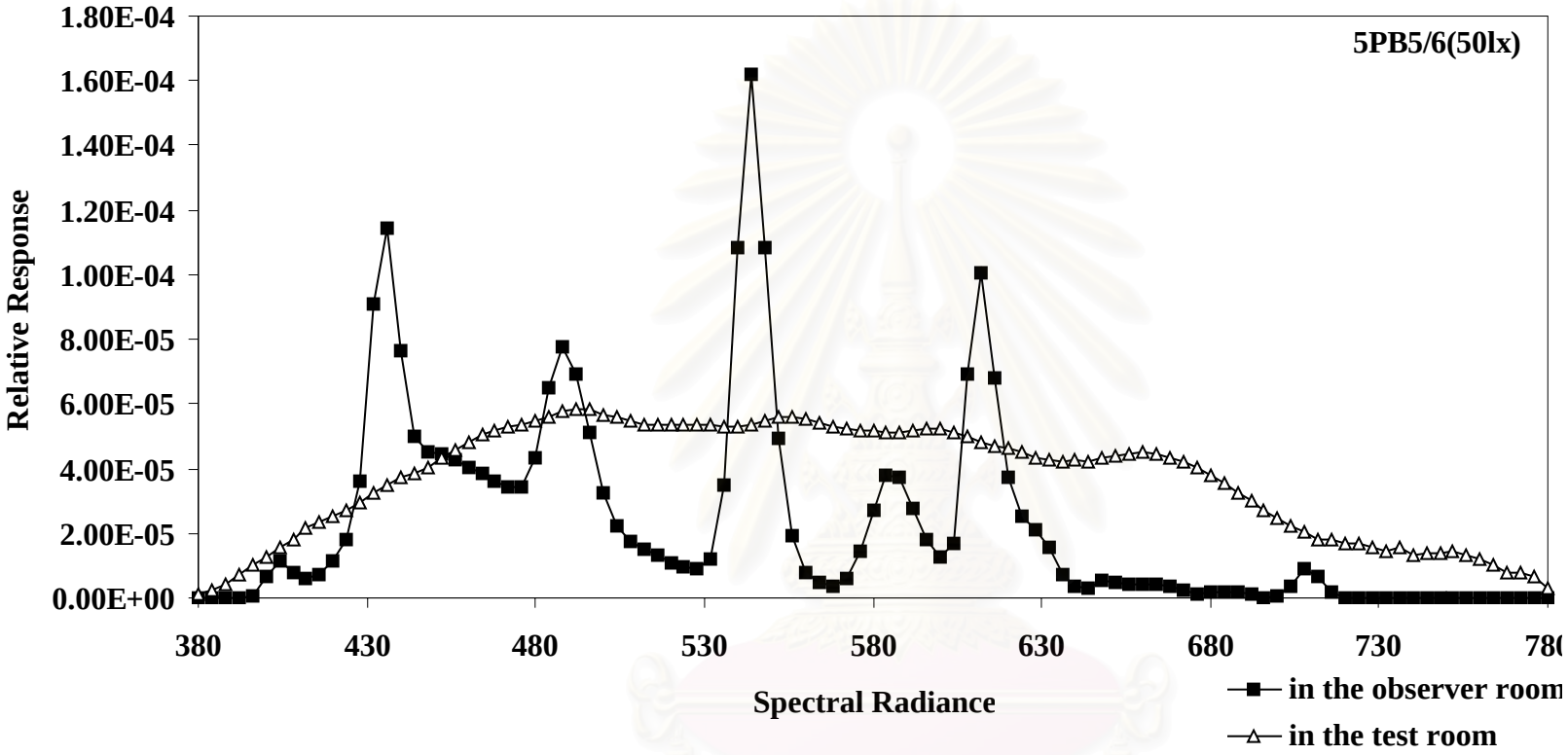


Fig.F-31b Compairison between the spatral of the color chart 5PB5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-32 The spectral distribution data of 5P5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	7.59E-07	9.94E-07		584	4.03E-06	9.58E-06	4.95E-05	5.80E-05
384	1.09E-07	1.09E-07	5.20E-07	2.15E-06		588	4.31E-06	1.01E-05	5.11E-05	6.15E-05
388	9.16E-08	9.16E-08	6.52E-07	3.31E-06		592	3.02E-06	1.07E-05	3.86E-05	6.45E-05
392	7.96E-08	1.09E-07	3.23E-07	4.73E-06		596	1.45E-06	1.12E-05	2.63E-05	6.70E-05
396	7.47E-08	4.83E-07	9.92E-07	7.07E-06		600	5.96E-07	1.15E-05	1.93E-05	6.87E-05
400	2.55E-07	4.19E-07	7.17E-06	1.03E-05		604	1.75E-06	1.15E-05	2.69E-05	6.94E-05
404	5.95E-07	9.72E-07	1.13E-05	1.24E-05		608	9.94E-06	1.15E-05	1.07E-04	6.86E-05
408	2.69E-07	1.31E-06	7.93E-06	1.50E-05		612	1.52E-05	1.11E-05	1.57E-04	6.68E-05
412	5.67E-08	1.68E-06	5.74E-06	1.77E-05		616	1.02E-05	1.11E-05	1.07E-04	6.54E-05
416	5.58E-08	1.89E-06	7.21E-06	1.93E-05		620	5.20E-06	1.06E-05	5.88E-05	6.37E-05
420	2.03E-07	1.80E-06	1.10E-05	1.97E-05		624	2.95E-06	1.00E-05	3.98E-05	6.23E-05
424	1.35E-06	1.59E-06	1.68E-05	2.13E-05		628	2.24E-06	9.76E-06	3.34E-05	6.10E-05
428	2.61E-06	2.36E-06	3.34E-05	2.33E-05		632	1.44E-06	1.02E-05	2.49E-05	6.03E-05
432	7.24E-06	2.72E-06	8.27E-05	2.50E-05		636	4.48E-07	1.00E-05	1.18E-05	6.00E-05
436	9.67E-06	2.70E-06	1.04E-04	2.65E-05		640	4.03E-08	1.00E-05	6.20E-06	6.05E-05
440	6.15E-06	3.30E-06	6.83E-05	2.78E-05		644	4.15E-08	9.77E-06	6.38E-06	6.14E-05
444	3.59E-06	3.35E-06	4.50E-05	2.88E-05		648	4.29E-08	1.01E-05	9.38E-06	6.27E-05
448	3.39E-06	3.46E-06	4.02E-05	2.95E-05		652	4.45E-08	1.00E-05	9.59E-06	6.39E-05
452	2.89E-06	4.26E-06	3.90E-05	3.10E-05		656	4.62E-08	1.03E-05	7.08E-06	6.49E-05
456	2.99E-06	4.60E-06	3.68E-05	3.27E-05		660	4.79E-08	9.90E-06	6.60E-06	6.48E-05
460	3.11E-06	5.31E-06	3.48E-05	3.43E-05		664	4.96E-08	1.01E-05	6.93E-06	6.41E-05
464	3.14E-06	5.77E-06	3.27E-05	3.53E-05		668	5.11E-08	9.94E-06	6.13E-06	6.33E-05
468	2.45E-06	5.51E-06	3.04E-05	3.56E-05		672	5.25E-08	9.88E-06	5.01E-06	6.14E-05
472	1.78E-06	5.63E-06	2.85E-05	3.59E-05		676	5.40E-08	9.43E-06	4.70E-06	5.88E-05
476	1.86E-06	5.79E-06	2.80E-05	3.59E-05		680	5.56E-08	9.19E-06	4.71E-06	5.62E-05
480	2.66E-06	5.75E-06	3.49E-05	3.66E-05		684	5.73E-08	8.82E-06	4.88E-06	5.39E-05
484	4.28E-06	5.88E-06	5.23E-05	3.70E-05		688	5.92E-08	8.15E-06	5.22E-06	5.03E-05
488	5.56E-06	6.02E-06	6.23E-05	3.74E-05		692	6.12E-08	7.38E-06	4.04E-06	4.73E-05
492	4.77E-06	6.36E-06	5.49E-05	3.75E-05		696	6.40E-08	6.97E-06	1.48E-06	4.34E-05
496	3.30E-06	5.72E-06	4.05E-05	3.74E-05		700	6.74E-08	6.29E-06	1.47E-06	4.09E-05
500	1.55E-06	5.54E-06	2.59E-05	3.64E-05		704	7.09E-08	6.06E-06	8.89E-06	3.79E-05
504	9.45E-07	5.26E-06	1.72E-05	3.54E-05		708	7.50E-08	4.84E-06	1.73E-05	3.54E-05
508	5.26E-07	5.36E-06	1.35E-05	3.45E-05		712	8.05E-08	3.91E-06	1.41E-05	3.30E-05
512	3.26E-07	5.19E-06	1.16E-05	3.39E-05		716	8.59E-08	3.31E-06	3.98E-06	3.06E-05
516	9.57E-08	5.26E-06	1.01E-05	3.35E-05		720	9.16E-08	3.04E-06	9.16E-08	2.91E-05
520	1.20E-07	5.39E-06	8.74E-06	3.36E-05		724	9.77E-08	3.11E-06	9.77E-08	2.67E-05
524	3.39E-08	5.14E-06	7.46E-06	3.38E-05		728	1.04E-07	1.13E-06	1.04E-07	2.53E-05
528	3.43E-08	5.00E-06	6.91E-06	3.37E-05		732	1.10E-07	1.44E-06	1.10E-07	2.43E-05
532	1.18E-07	5.03E-06	9.24E-06	3.36E-05		736	1.17E-07	4.07E-07	1.17E-07	2.43E-05
536	1.75E-06	5.40E-06	2.74E-05	3.36E-05		740	1.23E-07	1.23E-07	1.23E-07	2.24E-05
540	7.96E-06	5.45E-06	8.63E-05	3.39E-05		744	1.30E-07	1.30E-07	1.30E-07	2.11E-05
544	1.24E-05	5.93E-06	1.29E-04	3.43E-05		748	1.38E-07	1.38E-07	1.38E-07	1.86E-05
548	8.43E-06	6.01E-06	8.63E-05	3.55E-05		752	1.46E-07	1.46E-07	1.46E-07	1.63E-05
552	3.16E-06	6.26E-06	3.93E-05	3.71E-05		756	1.57E-07	1.57E-07	1.57E-07	1.51E-05
556	9.52E-07	6.41E-06	1.56E-05	3.82E-05		760	1.71E-07	1.71E-07	1.71E-07	1.43E-05
560	1.37E-07	6.67E-06	6.69E-06	3.96E-05		764	1.85E-07	1.85E-07	1.85E-07	1.18E-05
564	3.31E-08	7.40E-06	4.02E-06	4.17E-05		768	2.01E-07	2.01E-07	2.01E-07	8.54E-06
568	3.34E-08	7.52E-06	3.53E-06	4.46E-05		772	2.24E-07	2.24E-07	2.24E-07	3.22E-06
572	3.34E-08	7.85E-06	6.41E-06	4.77E-05		776	2.47E-07	2.47E-07	2.47E-07	2.97E-06
576	6.60E-07	8.52E-06	1.70E-05	5.13E-05		780	2.77E-07	2.77E-07	2.77E-07	1.50E-06
580	2.39E-06	8.88E-06	3.38E-05	5.44E-05						

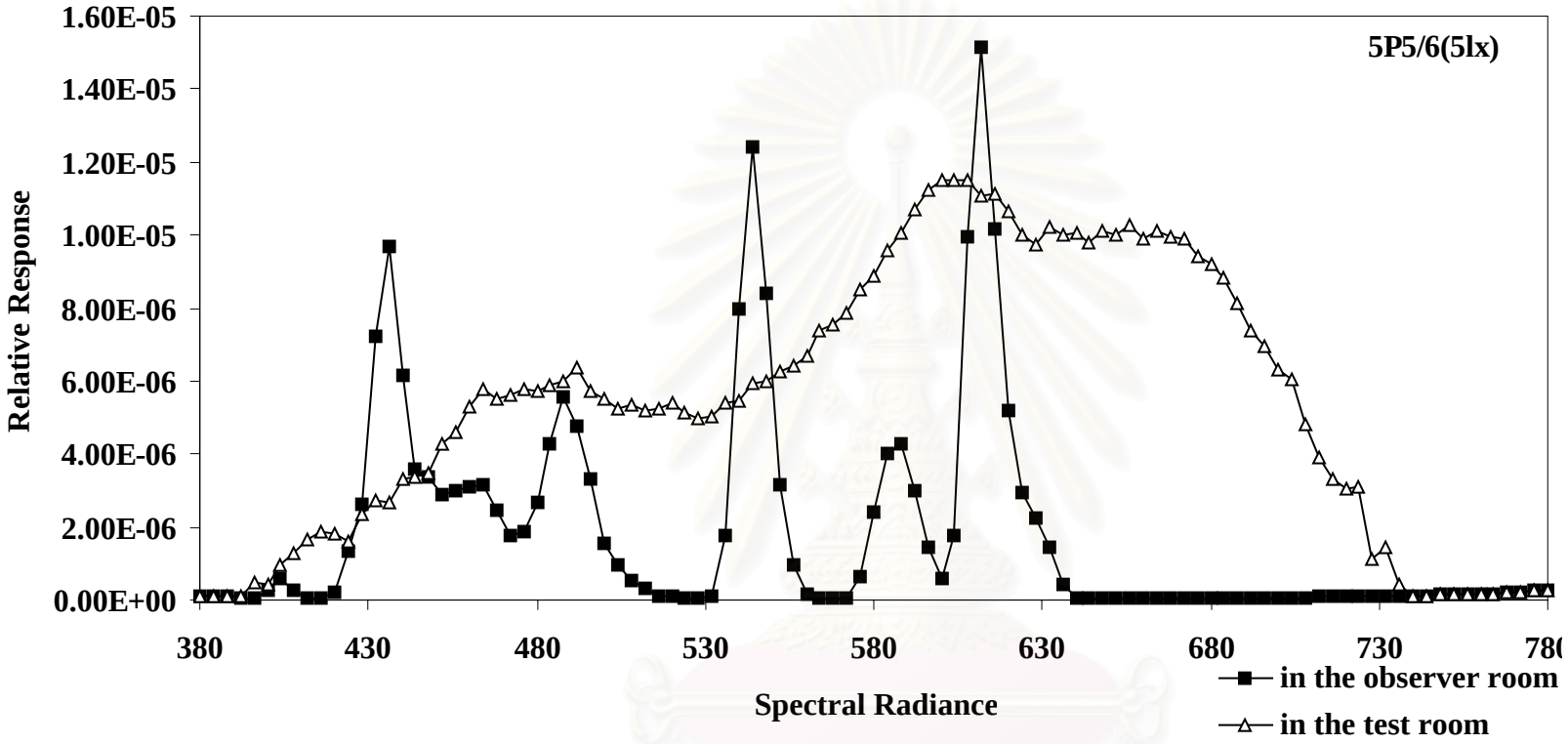


Fig.F-32a Compairison between the spatral of the color chart 5P5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room

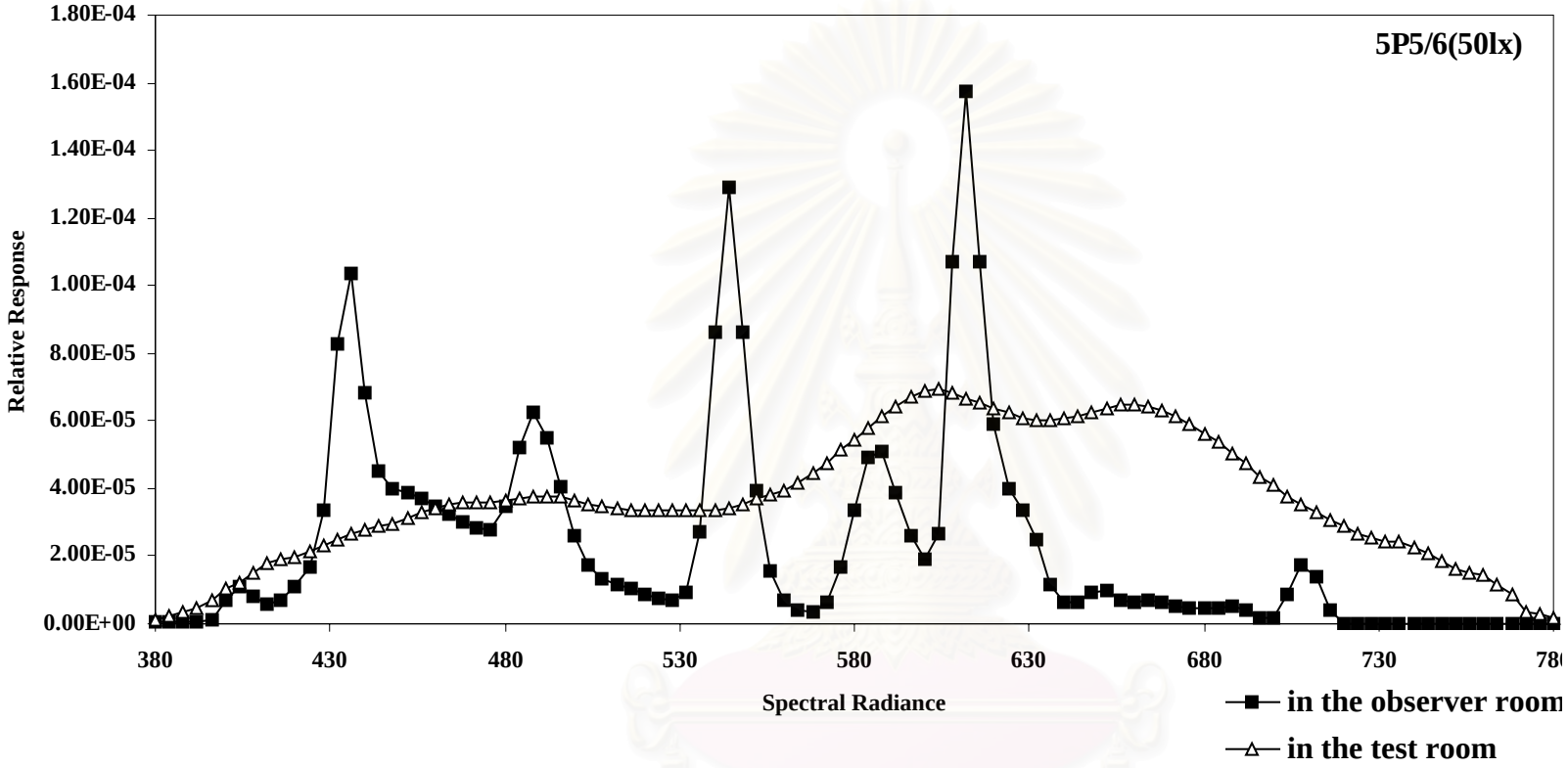


Fig.F-32b Compairison between the spatral of the color chart 5P5/6 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-33 The spectral distribution data of 5RP5/6 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.86E-06	3.68E-07		584	5.09E-06	1.06E-05	6.00E-05	6.83E-05
384	1.09E-07	1.09E-07	5.26E-07	9.74E-07		588	5.40E-06	1.15E-05	6.28E-05	7.52E-05
388	9.16E-08	3.18E-07	2.42E-07	3.27E-06		592	3.75E-06	1.23E-05	4.83E-05	8.10E-05
392	7.96E-08	9.36E-08	8.90E-08	4.43E-06		596	2.26E-06	1.32E-05	3.32E-05	8.56E-05
396	7.47E-08	1.15E-07	7.49E-07	6.17E-06		600	1.33E-06	1.39E-05	2.48E-05	8.92E-05
400	1.51E-07	2.54E-07	5.11E-06	7.75E-06		604	2.43E-06	1.41E-05	3.56E-05	9.17E-05
404	2.84E-07	4.49E-07	8.14E-06	9.39E-06		608	1.34E-05	1.46E-05	1.46E-04	9.27E-05
408	1.37E-07	6.60E-07	5.66E-06	1.03E-05		612	2.05E-05	1.41E-05	2.14E-04	9.22E-05
412	5.67E-08	7.56E-07	3.65E-06	1.14E-05		616	1.39E-05	1.43E-05	1.47E-04	9.20E-05
416	5.58E-08	2.18E-07	4.67E-06	1.27E-05		620	7.19E-06	1.42E-05	8.20E-05	9.12E-05
420	5.33E-08	7.95E-07	7.81E-06	1.26E-05		624	4.54E-06	1.39E-05	5.68E-05	8.95E-05
424	1.60E-07	1.01E-06	1.15E-05	1.36E-05		628	3.58E-06	1.37E-05	4.75E-05	8.75E-05
428	1.57E-06	1.02E-06	2.34E-05	1.46E-05		632	2.14E-06	1.33E-05	3.52E-05	8.63E-05
432	5.21E-06	1.19E-06	5.75E-05	1.57E-05		636	5.36E-07	1.28E-05	1.71E-05	8.46E-05
436	6.53E-06	1.66E-06	7.30E-05	1.69E-05		640	4.03E-08	1.28E-05	8.57E-06	8.29E-05
440	4.27E-06	1.83E-06	4.84E-05	1.79E-05		644	4.15E-08	1.23E-05	8.79E-06	8.12E-05
444	2.28E-06	1.89E-06	3.13E-05	1.85E-05		648	4.29E-08	1.21E-05	1.24E-05	8.07E-05
448	1.72E-06	2.13E-06	2.78E-05	1.92E-05		652	4.45E-08	1.21E-05	1.27E-05	8.00E-05
452	2.02E-06	2.37E-06	2.71E-05	2.02E-05		656	4.62E-08	1.16E-05	9.14E-06	7.87E-05
456	2.06E-06	2.87E-06	2.58E-05	2.15E-05		660	4.79E-08	1.10E-05	7.78E-06	7.66E-05
460	1.48E-06	2.81E-06	2.43E-05	2.30E-05		664	4.96E-08	1.15E-05	8.44E-06	7.46E-05
464	1.24E-06	3.07E-06	2.29E-05	2.39E-05		668	5.11E-08	1.09E-05	7.01E-06	7.19E-05
468	1.13E-06	2.98E-06	2.18E-05	2.42E-05		672	5.25E-08	1.03E-05	5.86E-06	6.96E-05
472	1.24E-06	3.18E-06	2.05E-05	2.40E-05		676	5.40E-08	1.05E-05	5.93E-06	6.66E-05
476	1.17E-06	3.30E-06	2.00E-05	2.43E-05		680	5.56E-08	9.45E-06	5.67E-06	6.26E-05
480	2.07E-06	3.39E-06	2.52E-05	2.50E-05		684	5.73E-08	8.91E-06	5.89E-06	6.00E-05
484	3.30E-06	3.41E-06	3.80E-05	2.55E-05		688	5.92E-08	8.84E-06	5.86E-06	5.75E-05
488	4.00E-06	3.53E-06	4.58E-05	2.62E-05		692	6.12E-08	8.91E-06	5.41E-06	5.45E-05
492	3.20E-06	3.73E-06	4.13E-05	2.68E-05		696	6.40E-08	7.46E-06	2.85E-06	5.10E-05
496	2.12E-06	3.84E-06	3.09E-05	2.66E-05		700	6.74E-08	6.90E-06	2.84E-06	4.85E-05
500	1.03E-06	3.18E-06	1.93E-05	2.65E-05		704	7.09E-08	5.95E-06	1.17E-05	4.63E-05
504	5.65E-07	3.24E-06	1.35E-05	2.59E-05		708	7.50E-08	5.93E-06	2.20E-05	4.34E-05
508	2.44E-07	3.46E-06	1.07E-05	2.58E-05		712	8.05E-08	5.21E-06	1.64E-05	3.97E-05
512	3.38E-08	3.61E-06	9.39E-06	2.60E-05		716	8.59E-08	4.49E-06	5.79E-06	3.79E-05
516	3.37E-08	3.41E-06	8.10E-06	2.64E-05		720	9.16E-08	3.57E-06	5.86E-07	3.55E-05
520	3.36E-08	3.77E-06	7.08E-06	2.69E-05		724	9.77E-08	2.58E-06	9.77E-08	3.31E-05
524	3.39E-08	3.69E-06	6.20E-06	2.68E-05		728	1.04E-07	1.23E-06	1.04E-07	2.84E-05
528	3.43E-08	3.64E-06	6.09E-06	2.75E-05		732	1.10E-07	1.10E-07	1.10E-07	2.60E-05
532	3.43E-08	3.81E-06	7.84E-06	2.74E-05		736	1.17E-07	1.17E-07	1.17E-07	2.50E-05
536	1.14E-06	4.09E-06	2.28E-05	2.72E-05		740	1.23E-07	1.23E-07	1.23E-07	2.13E-05
540	6.30E-06	3.80E-06	7.27E-05	2.74E-05		744	1.30E-07	1.30E-07	1.30E-07	1.95E-05
544	1.03E-05	3.78E-06	1.09E-04	2.77E-05		748	1.38E-07	1.38E-07	1.38E-07	1.71E-05
548	6.55E-06	4.16E-06	7.24E-05	2.81E-05		752	1.46E-07	1.46E-07	1.46E-07	1.43E-05
552	2.50E-06	4.28E-06	3.29E-05	2.93E-05		756	1.57E-07	1.57E-07	1.57E-07	1.17E-05
556	4.20E-07	4.32E-06	1.28E-05	3.10E-05		760	1.71E-07	1.71E-07	1.71E-07	8.66E-06
560	4.14E-08	4.68E-06	5.22E-06	3.32E-05		764	1.85E-07	1.85E-07	1.85E-07	6.46E-06
564	3.31E-08	5.22E-06	3.18E-06	3.64E-05		768	2.01E-07	2.01E-07	2.01E-07	4.53E-06
568	3.34E-08	6.36E-06	2.95E-06	4.14E-05		772	2.24E-07	2.24E-07	2.24E-07	1.22E-06
572	3.34E-08	7.06E-06	6.78E-06	4.74E-05		776	2.47E-07	2.47E-07	2.47E-07	1.08E-06
576	7.85E-07	8.23E-06	1.91E-05	5.42E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	2.75E-06	9.45E-06	3.96E-05	6.11E-05						

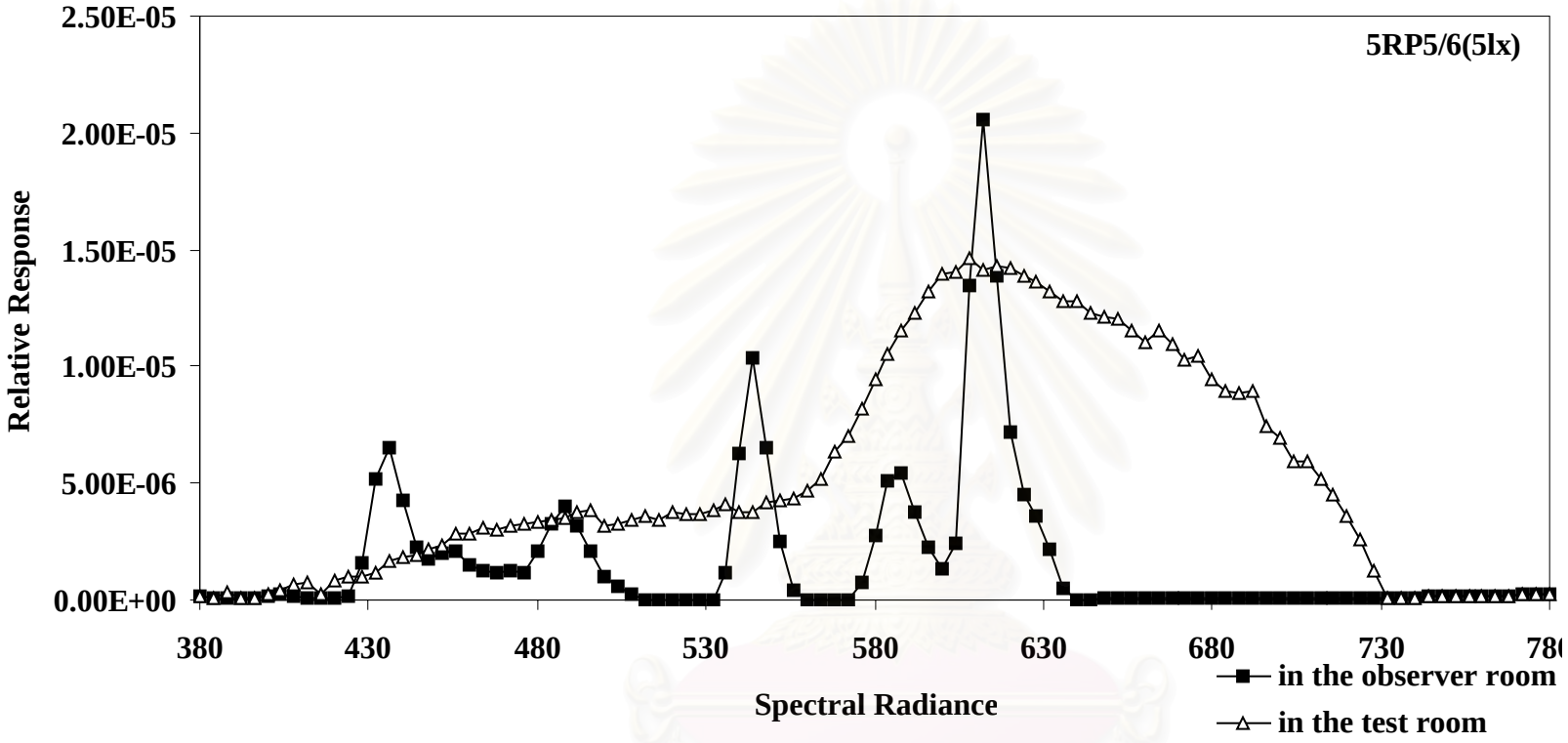


Fig.F-33a Compairison between the spatral of the color chart 5RP5/6 measured at the border of RVSI in the test room and at 5 lux in the observer room.

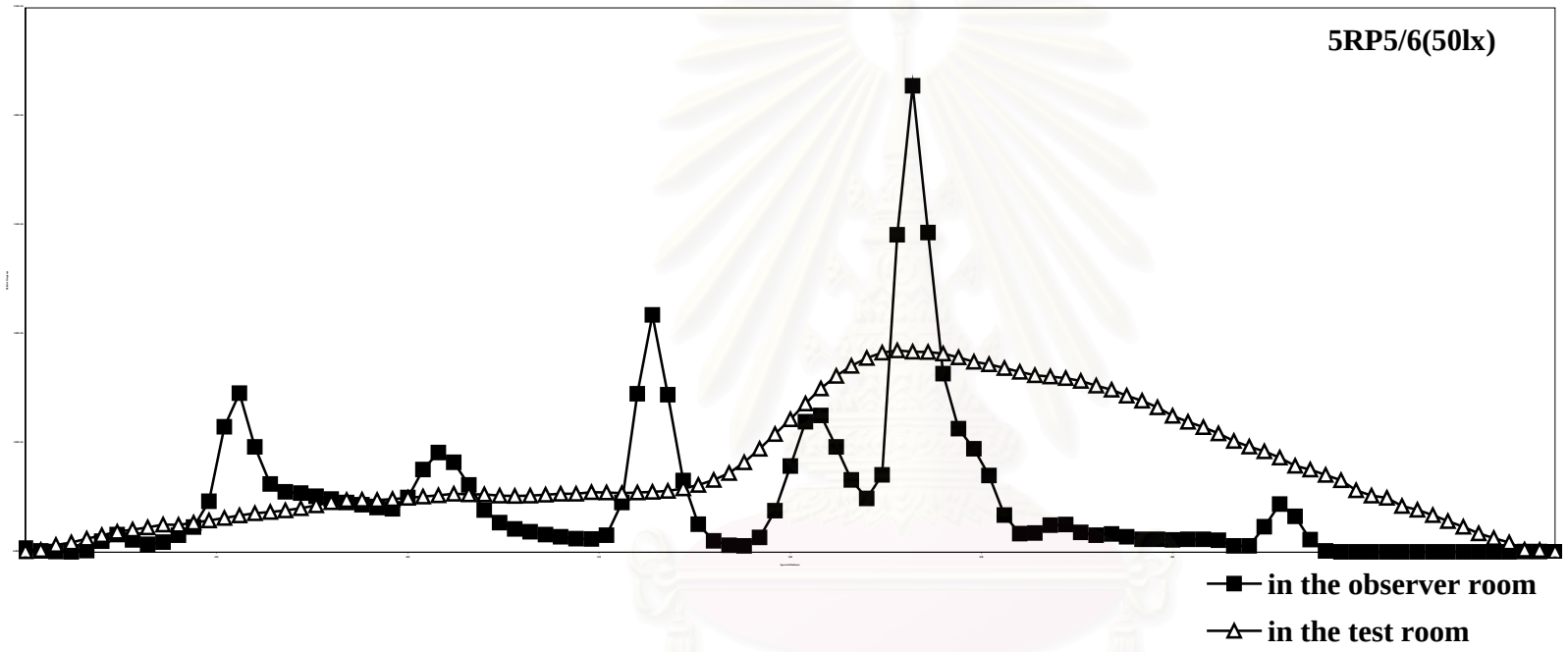


Fig.F-33b Compairison between the spatral of the color chart 5RP5/6 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-34 The spectral distribution data of 5R5/3 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.16E-06		584	4.54E-06	1.06E-05	5.51E-05	6.23E-05
384	1.09E-07	1.09E-07	1.09E-07	2.00E-06		588	4.55E-06	1.11E-05	5.57E-05	6.50E-05
388	9.16E-08	9.16E-08	1.67E-07	2.30E-06		592	3.38E-06	1.14E-05	4.19E-05	6.73E-05
392	7.96E-08	7.96E-08	1.04E-07	3.00E-06		596	1.97E-06	1.19E-05	2.82E-05	6.95E-05
396	7.47E-08	7.47E-08	8.73E-07	4.62E-06		600	8.08E-07	1.22E-05	2.00E-05	7.13E-05
400	6.86E-08	6.86E-08	4.21E-06	5.48E-06		604	1.50E-06	1.21E-05	2.84E-05	7.21E-05
404	6.21E-08	5.09E-07	6.53E-06	6.41E-06		608	1.09E-05	1.21E-05	1.17E-04	7.20E-05
408	5.81E-08	5.07E-07	5.19E-06	7.99E-06		612	1.68E-05	1.21E-05	1.73E-04	7.15E-05
412	5.67E-08	1.70E-07	3.08E-06	8.99E-06		616	1.10E-05	1.19E-05	1.18E-04	7.12E-05
416	5.58E-08	9.05E-08	3.68E-06	9.88E-06		620	5.62E-06	1.18E-05	6.55E-05	7.01E-05
420	1.53E-07	7.13E-08	5.72E-06	1.02E-05		624	3.46E-06	1.17E-05	4.47E-05	6.87E-05
424	2.51E-07	5.02E-07	8.91E-06	1.04E-05		628	2.32E-06	1.16E-05	3.78E-05	6.74E-05
428	9.62E-07	8.33E-07	1.86E-05	1.15E-05		632	1.15E-06	1.13E-05	2.79E-05	6.60E-05
432	3.75E-06	9.38E-07	4.63E-05	1.23E-05		636	1.13E-07	1.10E-05	1.34E-05	6.46E-05
436	5.27E-06	9.13E-07	5.83E-05	1.30E-05		640	4.03E-08	1.08E-05	6.61E-06	6.33E-05
440	3.30E-06	1.20E-06	3.83E-05	1.43E-05		644	4.15E-08	1.02E-05	6.68E-06	6.22E-05
444	1.73E-06	9.42E-07	2.47E-05	1.48E-05		648	4.29E-08	9.93E-06	9.02E-06	6.20E-05
448	1.46E-06	1.01E-06	2.24E-05	1.49E-05		652	4.45E-08	9.33E-06	9.44E-06	6.10E-05
452	1.66E-06	1.32E-06	2.19E-05	1.57E-05		656	4.62E-08	9.76E-06	6.40E-06	5.98E-05
456	1.28E-06	1.95E-06	2.11E-05	1.67E-05		660	4.79E-08	9.49E-06	5.68E-06	5.81E-05
460	1.15E-06	2.04E-06	2.00E-05	1.78E-05		664	4.96E-08	9.02E-06	5.78E-06	5.61E-05
464	7.18E-07	2.21E-06	1.93E-05	1.88E-05		668	5.11E-08	8.79E-06	5.77E-06	5.46E-05
468	1.03E-06	2.51E-06	1.83E-05	1.96E-05		672	5.25E-08	8.40E-06	4.59E-06	5.25E-05
472	6.44E-07	2.57E-06	1.76E-05	1.98E-05		676	5.40E-08	8.12E-06	4.25E-06	5.04E-05
476	6.67E-07	2.83E-06	1.75E-05	2.03E-05		680	5.56E-08	7.57E-06	3.88E-06	4.77E-05
480	1.66E-06	2.96E-06	2.31E-05	2.13E-05		684	5.73E-08	7.00E-06	4.22E-06	4.51E-05
484	2.81E-06	2.95E-06	3.52E-05	2.27E-05		688	5.92E-08	6.83E-06	4.26E-06	4.27E-05
488	3.68E-06	3.27E-06	4.28E-05	2.40E-05		692	6.12E-08	6.25E-06	2.79E-06	4.08E-05
492	3.37E-06	3.22E-06	3.87E-05	2.46E-05		696	6.40E-08	5.95E-06	1.08E-06	3.83E-05
496	2.13E-06	3.48E-06	2.95E-05	2.50E-05		700	6.74E-08	5.57E-06	1.69E-06	3.62E-05
500	1.45E-06	3.80E-06	1.91E-05	2.59E-05		704	7.09E-08	4.69E-06	9.07E-06	3.39E-05
504	4.51E-07	3.93E-06	1.38E-05	2.61E-05		708	7.50E-08	4.64E-06	1.73E-05	3.16E-05
508	3.43E-08	3.86E-06	1.10E-05	2.65E-05		712	8.05E-08	3.37E-06	1.30E-05	2.93E-05
512	3.38E-08	3.62E-06	9.95E-06	2.71E-05		716	8.59E-08	2.44E-06	4.24E-06	2.68E-05
516	3.37E-08	4.37E-06	9.33E-06	2.82E-05		720	9.16E-08	1.93E-06	1.98E-07	2.58E-05
520	3.36E-08	4.25E-06	7.80E-06	2.92E-05		724	9.77E-08	4.03E-07	9.77E-08	2.32E-05
524	3.39E-08	4.31E-06	6.75E-06	3.01E-05		728	1.04E-07	2.65E-07	1.04E-07	2.11E-05
528	3.43E-08	4.61E-06	6.53E-06	3.08E-05		732	1.10E-07	1.10E-07	1.10E-07	1.82E-05
532	3.43E-08	4.70E-06	9.24E-06	3.14E-05		736	1.17E-07	1.17E-07	1.17E-07	1.65E-05
536	1.64E-06	4.72E-06	2.73E-05	3.20E-05		740	1.23E-07	1.23E-07	1.23E-07	1.55E-05
540	8.02E-06	5.42E-06	8.67E-05	3.28E-05		744	1.30E-07	1.30E-07	1.30E-07	1.31E-05
544	1.28E-05	5.44E-06	1.30E-04	3.32E-05		748	1.38E-07	1.38E-07	1.38E-07	1.04E-05
548	8.23E-06	5.58E-06	8.73E-05	3.47E-05		752	1.46E-07	1.46E-07	1.46E-07	7.43E-06
552	3.46E-06	6.09E-06	4.00E-05	3.70E-05		756	1.57E-07	1.57E-07	1.57E-07	5.91E-06
556	7.30E-07	6.84E-06	1.59E-05	3.93E-05		760	1.71E-07	1.71E-07	1.71E-07	4.83E-06
560	3.27E-08	7.48E-06	6.84E-06	4.24E-05		764	1.85E-07	1.85E-07	1.85E-07	4.05E-06
564	3.31E-08	7.99E-06	4.04E-06	4.57E-05		768	2.01E-07	2.01E-07	2.01E-07	2.83E-06
568	3.34E-08	8.35E-06	3.64E-06	4.96E-05		772	2.24E-07	2.24E-07	2.24E-07	7.74E-07
572	3.34E-08	9.08E-06	7.50E-06	5.34E-05		776	2.47E-07	2.47E-07	2.47E-07	8.03E-07
576	8.39E-07	9.85E-06	1.97E-05	5.66E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	2.65E-06	1.02E-05	3.82E-05	5.96E-05						

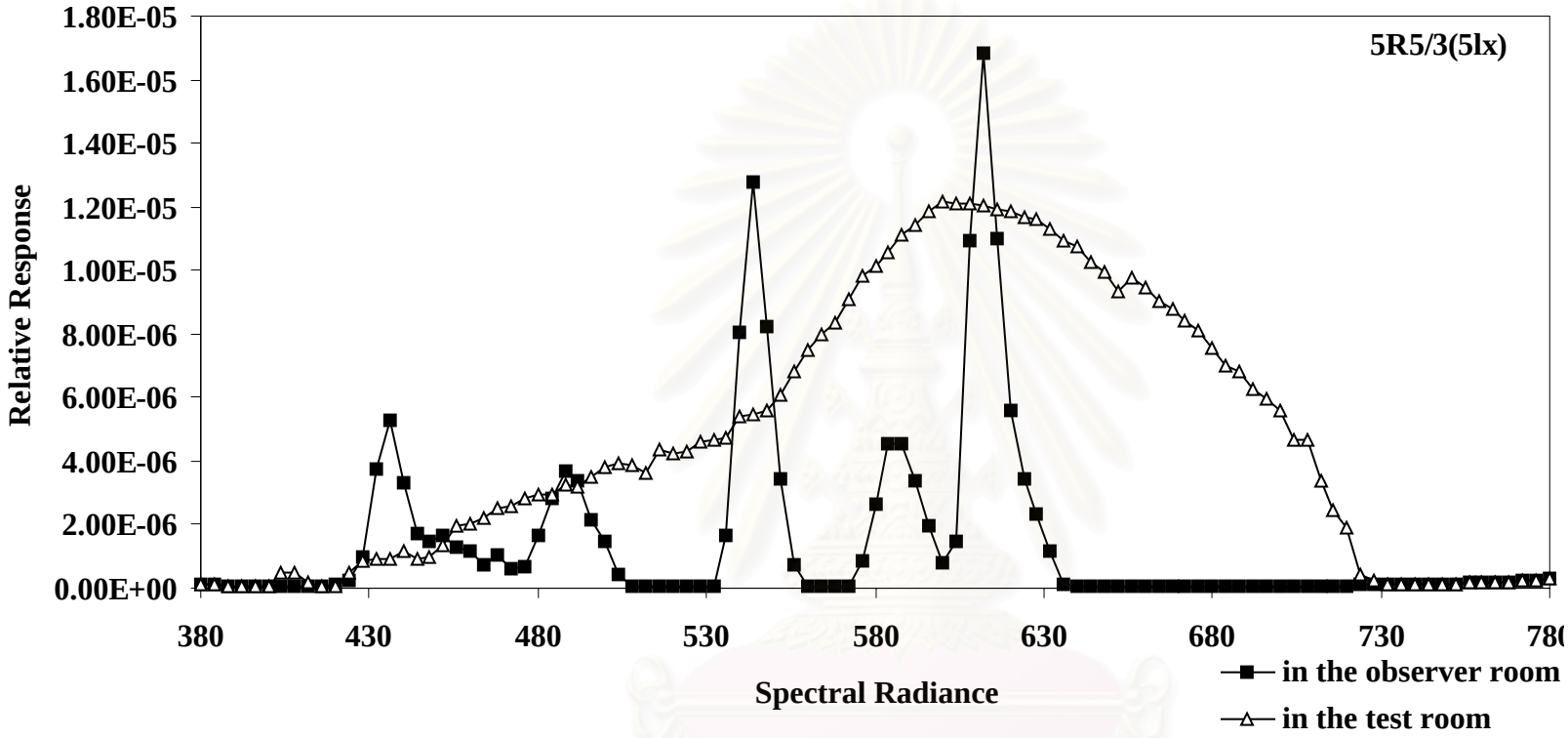


Fig.F-34a Compairison between the spatral of the color chart 5R5/3 measured at the border of RVSI in the test room and at 5 lux in the observer room

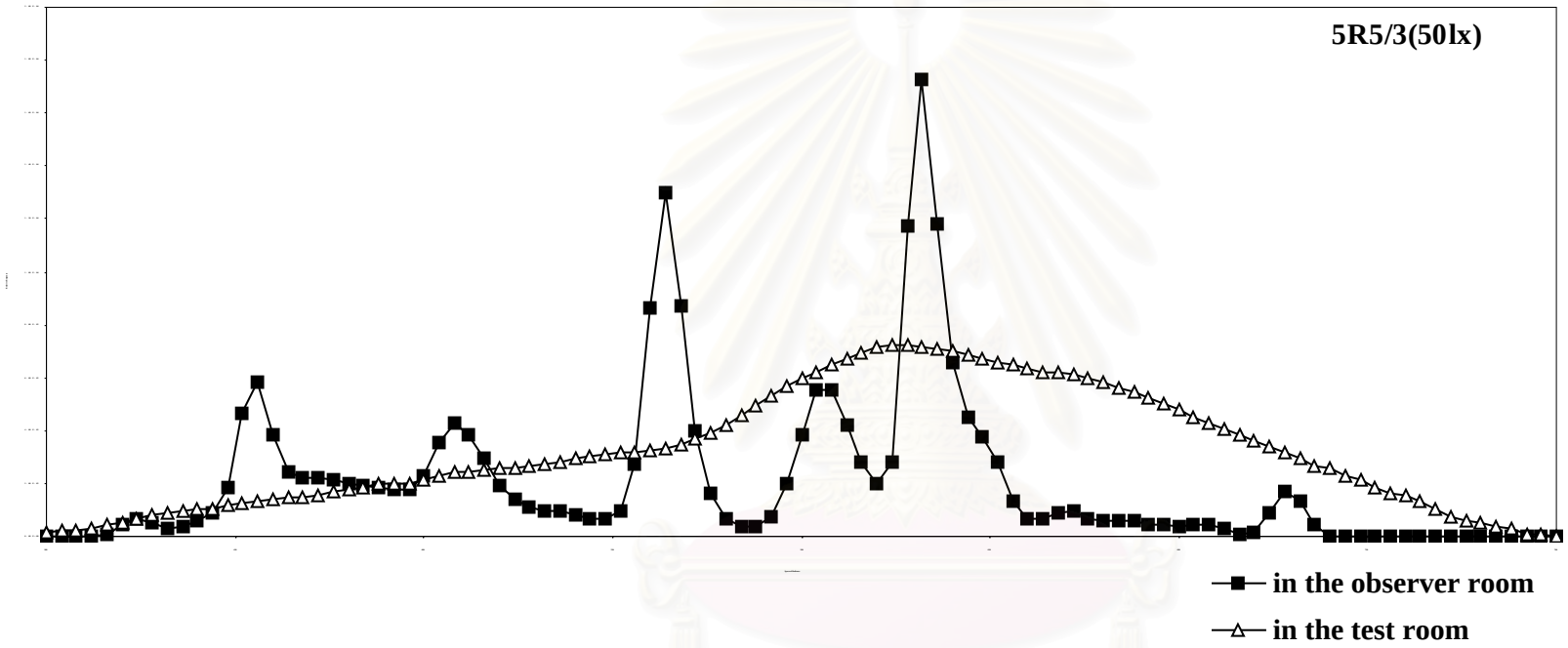


Fig.F-34b Compairison between the spatral of the color chart 5R5/3 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-35 The spectral distribution data of 5Y5/3 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.43E-07	1.53E-06		584	4.08E-06	1.06E-05	5.09E-05	6.66E-05
384	1.09E-07	1.09E-07	1.09E-07	2.36E-06		588	4.10E-06	1.06E-05	5.05E-05	6.75E-05
388	9.16E-08	9.16E-08	6.95E-07	2.05E-06		592	2.82E-06	1.06E-05	3.72E-05	6.87E-05
392	7.96E-08	7.96E-08	3.32E-07	2.80E-06		596	1.46E-06	1.08E-05	2.45E-05	7.02E-05
396	7.47E-08	7.47E-08	4.06E-07	3.67E-06		600	4.68E-07	1.10E-05	1.74E-05	7.12E-05
400	6.86E-08	6.86E-08	2.33E-06	3.56E-06		604	1.08E-06	1.12E-05	2.46E-05	7.19E-05
404	6.21E-08	6.21E-08	3.63E-06	4.64E-06		608	8.89E-06	1.09E-05	1.01E-04	7.19E-05
408	5.81E-08	5.81E-08	2.39E-06	5.01E-06		612	1.40E-05	1.13E-05	1.49E-04	7.08E-05
412	5.67E-08	5.67E-08	1.79E-06	5.56E-06		616	9.07E-06	1.13E-05	1.02E-04	7.01E-05
416	5.58E-08	5.58E-08	2.04E-06	6.23E-06		620	4.46E-06	1.09E-05	5.65E-05	6.87E-05
420	6.00E-08	5.33E-08	3.02E-06	5.63E-06		624	2.72E-06	1.05E-05	3.86E-05	6.75E-05
424	2.18E-07	5.01E-08	5.81E-06	6.34E-06		628	1.82E-06	1.06E-05	3.23E-05	6.61E-05
428	6.85E-07	4.80E-08	1.16E-05	6.89E-06		632	1.02E-06	1.01E-05	2.39E-05	6.47E-05
432	2.40E-06	4.68E-08	2.92E-05	7.63E-06		636	3.94E-08	9.70E-06	1.10E-05	6.34E-05
436	2.86E-06	2.24E-07	3.63E-05	8.41E-06		640	4.03E-08	9.40E-06	5.70E-06	6.20E-05
440	1.24E-06	5.17E-07	2.39E-05	9.37E-06		644	4.15E-08	9.00E-06	5.69E-06	6.06E-05
444	4.52E-07	3.91E-07	1.53E-05	9.74E-06		648	4.29E-08	9.03E-06	7.94E-06	6.02E-05
448	4.52E-07	4.55E-07	1.43E-05	1.07E-05		652	4.45E-08	8.83E-06	8.03E-06	5.97E-05
452	8.49E-07	5.43E-07	1.43E-05	1.17E-05		656	4.62E-08	8.65E-06	5.51E-06	5.84E-05
456	6.57E-07	1.06E-06	1.36E-05	1.26E-05		660	4.79E-08	8.61E-06	4.77E-06	5.69E-05
460	3.24E-07	1.31E-06	1.29E-05	1.35E-05		664	4.96E-08	7.76E-06	4.88E-06	5.50E-05
464	2.78E-07	1.31E-06	1.23E-05	1.40E-05		668	5.11E-08	7.65E-06	4.28E-06	5.34E-05
468	3.32E-07	1.45E-06	1.16E-05	1.43E-05		672	5.25E-08	7.03E-06	3.71E-06	5.18E-05
472	4.46E-07	1.33E-06	1.18E-05	1.51E-05		676	5.40E-08	6.99E-06	3.41E-06	4.93E-05
476	4.94E-07	1.69E-06	1.23E-05	1.57E-05		680	5.56E-08	6.63E-06	3.08E-06	4.67E-05
480	7.33E-07	1.67E-06	1.65E-05	1.65E-05		684	5.73E-08	6.13E-06	3.09E-06	4.44E-05
484	1.56E-06	2.09E-06	2.62E-05	1.81E-05		688	5.92E-08	6.02E-06	3.16E-06	4.17E-05
488	2.41E-06	2.59E-06	3.27E-05	2.01E-05		692	6.12E-08	5.52E-06	2.43E-06	3.86E-05
492	2.16E-06	2.91E-06	3.07E-05	2.21E-05		696	6.40E-08	4.79E-06	9.41E-07	3.65E-05
496	1.53E-06	2.81E-06	2.44E-05	2.39E-05		700	6.74E-08	4.39E-06	1.37E-06	3.48E-05
500	8.69E-07	3.30E-06	1.68E-05	2.64E-05		704	7.09E-08	3.55E-06	6.60E-06	3.29E-05
504	3.62E-07	3.72E-06	1.25E-05	2.90E-05		708	7.50E-08	2.77E-06	1.38E-05	3.05E-05
508	1.87E-07	4.49E-06	1.09E-05	3.13E-05		712	8.05E-08	3.08E-06	1.12E-05	2.84E-05
512	1.73E-07	5.11E-06	1.05E-05	3.41E-05		716	8.59E-08	1.85E-06	2.97E-06	2.63E-05
516	1.95E-07	5.49E-06	9.79E-06	3.73E-05		720	9.16E-08	9.73E-07	9.16E-08	2.46E-05
520	4.91E-08	5.68E-06	8.84E-06	4.04E-05		724	9.77E-08	1.86E-07	9.77E-08	2.28E-05
524	3.39E-08	6.16E-06	8.04E-06	4.24E-05		728	1.04E-07	1.04E-07	1.04E-07	2.03E-05
528	3.43E-08	6.68E-06	7.88E-06	4.37E-05		732	1.10E-07	1.10E-07	1.10E-07	1.75E-05
532	2.52E-07	6.93E-06	1.08E-05	4.49E-05		736	1.17E-07	1.17E-07	1.17E-07	1.60E-05
536	2.35E-06	6.82E-06	3.26E-05	4.56E-05		740	1.23E-07	1.23E-07	1.23E-07	1.37E-05
540	9.46E-06	7.00E-06	1.05E-04	4.65E-05		744	1.30E-07	1.30E-07	1.30E-07	1.22E-05
544	1.51E-05	7.93E-06	1.57E-04	4.78E-05		748	1.38E-07	1.38E-07	1.38E-07	8.84E-06
548	1.02E-05	8.19E-06	1.05E-04	4.96E-05		752	1.46E-07	1.46E-07	1.46E-07	8.15E-06
552	4.25E-06	8.61E-06	4.81E-05	5.25E-05		756	1.57E-07	1.57E-07	1.57E-07	7.76E-06
556	8.94E-07	9.05E-06	1.87E-05	5.48E-05		760	1.71E-07	1.71E-07	1.71E-07	4.31E-06
560	3.27E-08	9.33E-06	7.48E-06	5.73E-05		764	1.85E-07	1.85E-07	1.85E-07	2.35E-06
564	3.31E-08	9.57E-06	4.44E-06	5.96E-05		768	2.01E-07	2.01E-07	2.01E-07	1.72E-06
568	3.34E-08	1.02E-05	4.30E-06	6.18E-05		772	2.24E-07	2.24E-07	2.24E-07	2.28E-07
572	3.34E-08	1.01E-05	7.41E-06	6.33E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	6.42E-07	1.04E-05	1.84E-05	6.46E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	2.38E-06	1.04E-05	3.55E-05	6.55E-05						

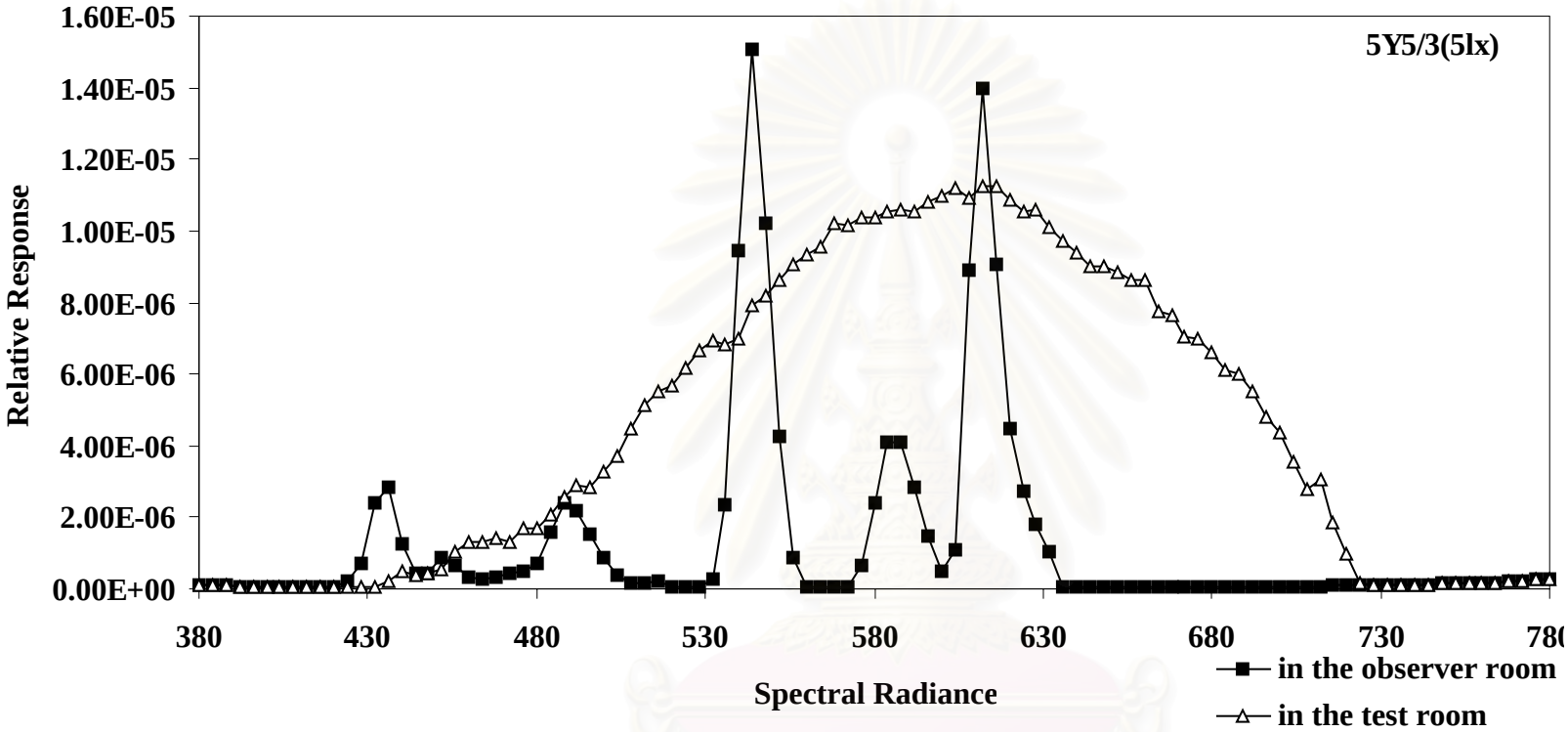


Fig.F-35a Compairison between the spatral of the color chart 5Y5/3 measured at the border of RVSI in the test room and at 5 lux in the observer room

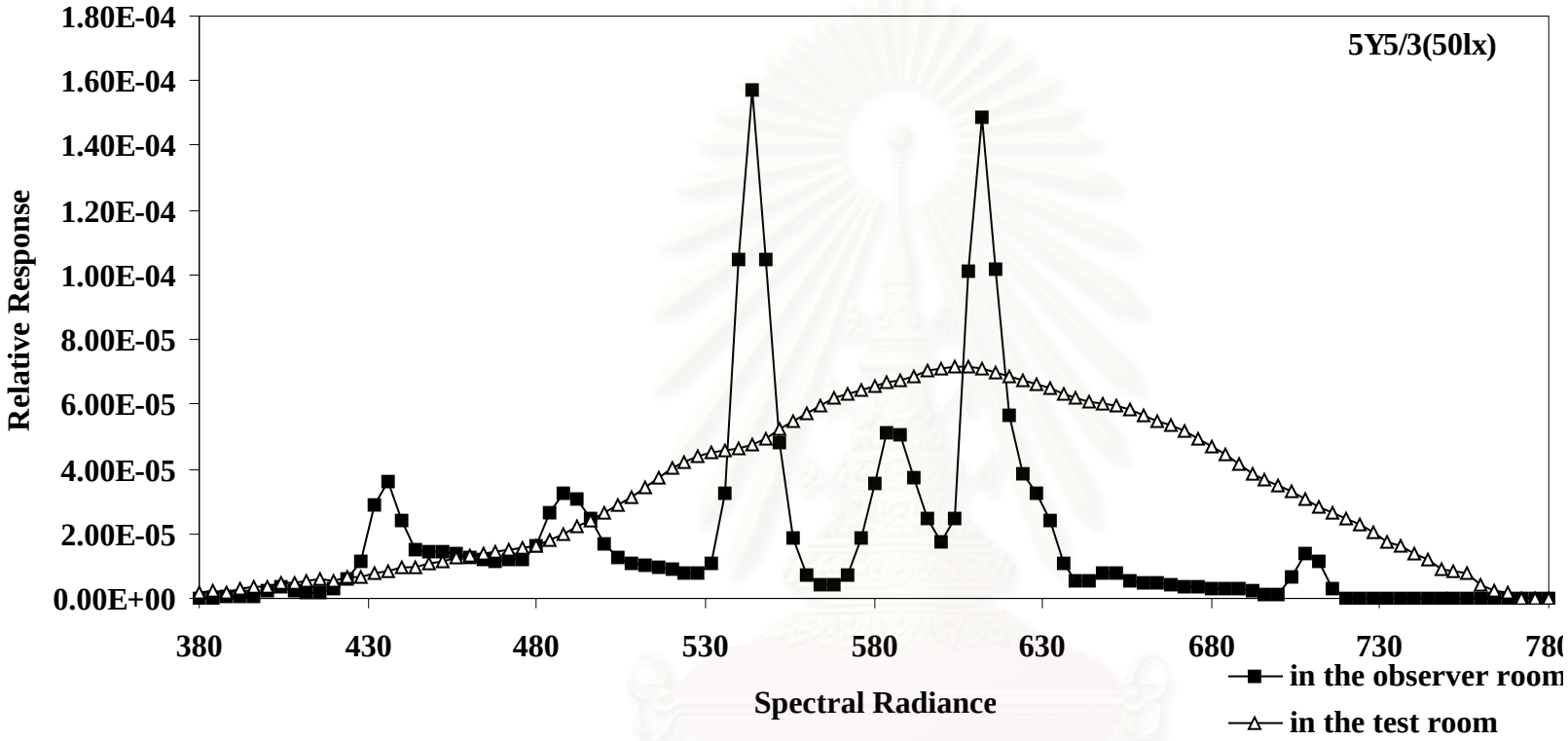


Fig.F-35b Compairison between the spatral of the color chart 5Y5/3 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-36 The spectral distribution data of 5G5/3 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	2.97E-07	9.54E-07		584	3.01E-06	7.59E-06	4.38E-05	5.97E-05
384	1.09E-07	1.09E-07	2.63E-07	1.95E-06		588	3.20E-06	7.55E-06	4.19E-05	5.76E-05
388	9.16E-08	9.16E-08	1.24E-07	2.09E-06		592	1.87E-06	7.04E-06	3.02E-05	5.61E-05
392	7.96E-08	5.01E-07	7.96E-08	3.56E-06		596	8.40E-07	6.98E-06	1.86E-05	5.39E-05
396	1.15E-07	7.47E-08	4.39E-07	5.04E-06		600	1.78E-07	6.64E-06	1.25E-05	5.14E-05
400	2.12E-07	6.86E-08	3.14E-06	6.73E-06		604	6.13E-07	6.06E-06	1.63E-05	4.93E-05
404	6.21E-08	6.21E-08	5.75E-06	7.61E-06		608	5.07E-06	5.63E-06	6.44E-05	4.67E-05
408	5.81E-08	2.48E-07	4.51E-06	8.47E-06		612	8.14E-06	4.85E-06	9.43E-05	4.39E-05
412	5.67E-08	2.83E-07	2.78E-06	9.85E-06		616	5.30E-06	4.72E-06	6.34E-05	4.18E-05
416	5.58E-08	4.89E-07	3.03E-06	1.07E-05		620	2.14E-06	4.84E-06	3.42E-05	4.03E-05
420	8.48E-08	5.15E-07	5.77E-06	1.09E-05		624	7.52E-07	4.15E-06	2.23E-05	3.85E-05
424	7.69E-07	2.44E-07	8.53E-06	1.17E-05		628	2.33E-07	3.89E-06	1.85E-05	3.66E-05
428	1.23E-06	9.82E-07	1.76E-05	1.30E-05		632	3.88E-08	3.78E-06	1.33E-05	3.53E-05
432	3.62E-06	1.04E-06	4.38E-05	1.41E-05		636	3.94E-08	3.22E-06	6.15E-06	3.43E-05
436	4.96E-06	9.96E-07	5.53E-05	1.52E-05		640	4.03E-08	3.41E-06	2.58E-06	3.31E-05
440	3.36E-06	1.10E-06	3.69E-05	1.61E-05		644	4.15E-08	3.19E-06	2.42E-06	3.19E-05
444	1.55E-06	1.02E-06	2.41E-05	1.69E-05		648	4.29E-08	2.89E-06	3.80E-06	3.18E-05
448	1.25E-06	1.96E-06	2.22E-05	1.85E-05		652	4.45E-08	3.00E-06	4.12E-06	3.10E-05
452	1.57E-06	1.68E-06	2.22E-05	1.98E-05		656	4.62E-08	2.93E-06	2.60E-06	3.08E-05
456	1.33E-06	2.20E-06	2.18E-05	2.14E-05		660	4.79E-08	2.82E-06	2.17E-06	3.03E-05
460	1.24E-06	2.50E-06	2.09E-05	2.33E-05		664	4.96E-08	2.62E-06	2.32E-06	2.99E-05
464	1.22E-06	2.73E-06	2.05E-05	2.49E-05		668	5.11E-08	2.50E-06	1.87E-06	2.96E-05
468	1.04E-06	3.05E-06	1.98E-05	2.61E-05		672	5.25E-08	2.29E-06	1.61E-06	2.92E-05
472	1.16E-06	3.10E-06	1.90E-05	2.74E-05		676	5.40E-08	2.04E-06	1.31E-06	2.82E-05
476	1.11E-06	3.08E-06	1.92E-05	2.91E-05		680	5.56E-08	1.55E-06	1.63E-06	2.73E-05
480	1.68E-06	3.52E-06	2.61E-05	3.04E-05		684	5.73E-08	1.95E-06	7.04E-07	2.72E-05
484	3.18E-06	3.81E-06	4.09E-05	3.25E-05		688	5.92E-08	1.55E-06	3.49E-07	2.62E-05
488	4.40E-06	4.07E-06	5.09E-05	3.54E-05		692	6.12E-08	1.11E-06	6.20E-08	2.47E-05
492	4.25E-06	4.38E-06	4.72E-05	3.83E-05		696	6.40E-08	1.79E-07	1.15E-07	2.31E-05
496	2.58E-06	5.11E-06	3.65E-05	4.00E-05		700	6.74E-08	5.75E-07	5.62E-07	2.16E-05
500	1.94E-06	5.30E-06	2.46E-05	4.19E-05		704	7.09E-08	9.32E-07	4.62E-06	2.06E-05
504	1.05E-06	5.39E-06	1.79E-05	4.41E-05		708	7.50E-08	2.06E-07	8.44E-06	1.95E-05
508	9.59E-07	5.64E-06	1.51E-05	4.63E-05		712	8.05E-08	8.05E-08	6.49E-06	1.74E-05
512	5.69E-07	6.07E-06	1.39E-05	4.86E-05		716	8.59E-08	8.59E-08	1.35E-06	1.60E-05
516	4.27E-07	6.44E-06	1.28E-05	5.12E-05		720	9.16E-08	9.16E-08	9.16E-08	1.49E-05
520	1.12E-07	6.93E-06	1.14E-05	5.41E-05		724	9.77E-08	9.77E-08	9.77E-08	1.39E-05
524	3.39E-08	6.54E-06	1.04E-05	5.62E-05		728	1.04E-07	1.04E-07	1.04E-07	1.19E-05
528	3.43E-08	7.01E-06	9.85E-06	5.76E-05		732	1.10E-07	1.10E-07	1.10E-07	1.13E-05
532	2.01E-07	7.74E-06	1.30E-05	5.87E-05		736	1.17E-07	1.17E-07	1.17E-07	9.04E-06
536	2.94E-06	7.94E-06	3.92E-05	5.95E-05		740	1.23E-07	1.23E-07	1.23E-07	9.02E-06
540	1.16E-05	8.28E-06	1.24E-04	5.96E-05		744	1.30E-07	1.30E-07	1.30E-07	6.68E-06
544	1.84E-05	8.17E-06	1.85E-04	6.05E-05		748	1.38E-07	1.38E-07	1.38E-07	5.57E-06
548	1.21E-05	8.57E-06	1.23E-04	6.18E-05		752	1.46E-07	1.46E-07	1.46E-07	5.94E-06
552	4.97E-06	9.06E-06	5.59E-05	6.37E-05		756	1.57E-07	1.57E-07	1.57E-07	3.73E-06
556	1.16E-06	9.21E-06	2.17E-05	6.53E-05		760	1.71E-07	1.71E-07	1.71E-07	2.20E-06
560	4.14E-08	9.48E-06	8.82E-06	6.62E-05		764	1.85E-07	1.85E-07	1.85E-07	5.09E-07
564	3.31E-08	9.03E-06	5.42E-06	6.67E-05		768	2.01E-07	2.01E-07	2.01E-07	3.57E-07
568	3.34E-08	8.93E-06	4.57E-06	6.61E-05		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	8.71E-06	7.67E-06	6.54E-05		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	6.24E-07	8.53E-06	1.70E-05	6.38E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.90E-06	8.19E-06	3.15E-05	6.19E-05						

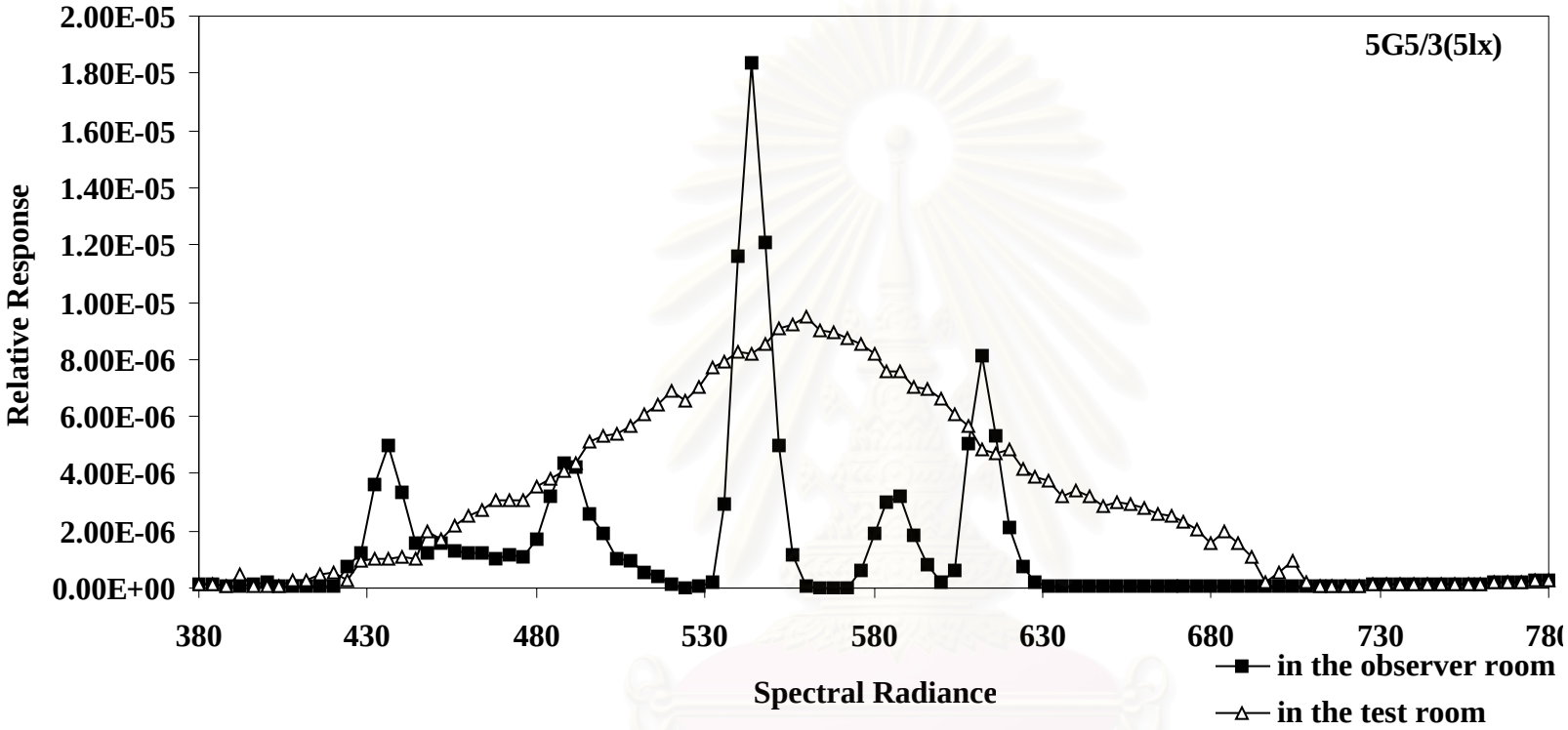


Fig.F-36a Compairison between the spatral of the color chart 5G5/3 measured at the border of RVSI in the test room and at 5 lux in the observer room.

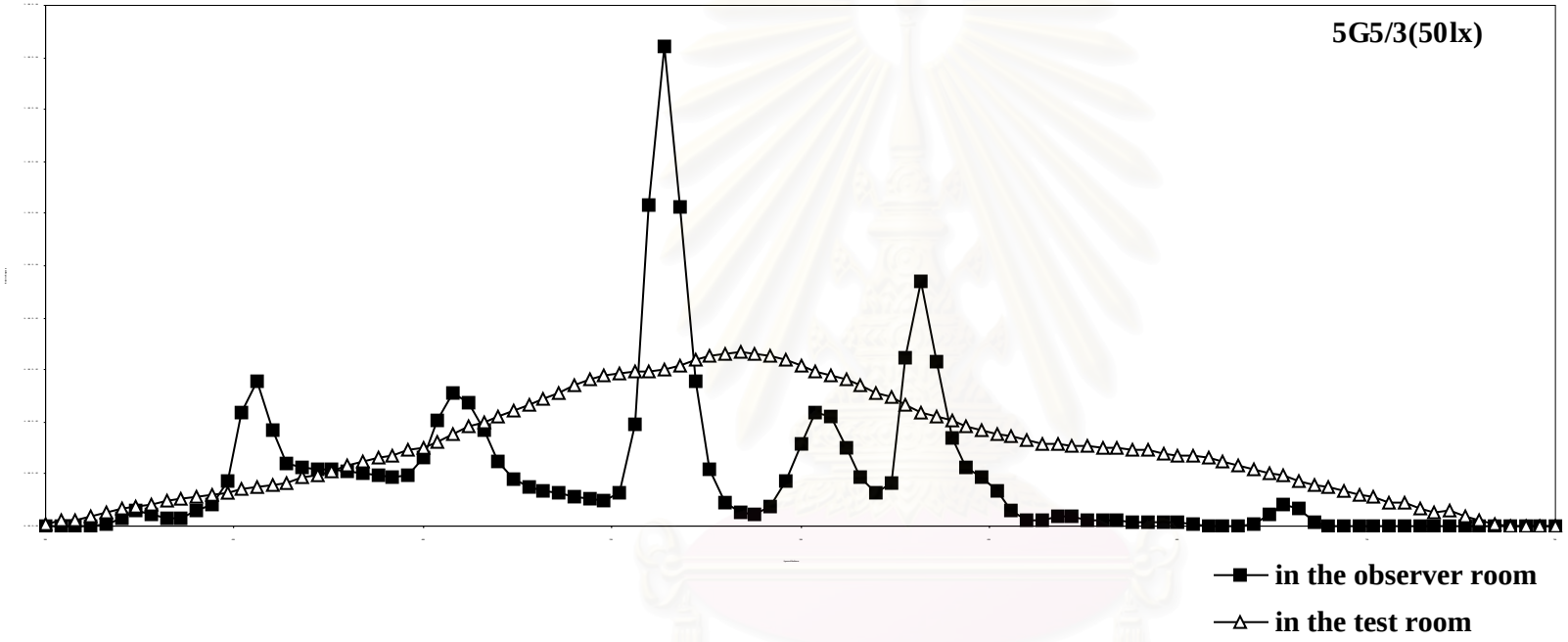


Fig.F-36b Compairison between the spatral of the color chart 5G5/3 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-37 The spectral distribution data of 5B5/3 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	2.43E-06		584	3.01E-06	6.94E-06	3.80E-05	5.21E-05
384	1.09E-07	1.09E-07	4.93E-07	2.70E-06		588	2.78E-06	6.36E-06	3.70E-05	5.14E-05
388	9.16E-08	9.16E-08	1.73E-07	3.44E-06		592	1.70E-06	6.46E-06	2.68E-05	5.10E-05
392	7.96E-08	2.20E-07	9.41E-08	5.64E-06		596	5.42E-07	6.24E-06	1.72E-05	5.06E-05
396	7.47E-08	1.96E-07	9.33E-07	8.65E-06		600	1.05E-07	6.17E-06	1.17E-05	5.00E-05
400	6.86E-08	5.62E-07	5.07E-06	1.02E-05		604	7.43E-07	6.01E-06	1.63E-05	4.90E-05
404	2.72E-07	4.59E-07	7.84E-06	1.27E-05		608	5.79E-06	5.94E-06	6.69E-05	4.79E-05
408	2.69E-07	1.24E-06	5.55E-06	1.45E-05		612	8.65E-06	5.63E-06	9.76E-05	4.68E-05
412	5.67E-08	1.23E-06	3.65E-06	1.61E-05		616	5.38E-06	5.17E-06	6.62E-05	4.61E-05
416	5.58E-08	1.05E-06	5.09E-06	1.74E-05		620	2.43E-06	5.50E-06	3.62E-05	4.54E-05
420	7.13E-08	1.41E-06	8.06E-06	1.78E-05		624	1.16E-06	5.43E-06	2.43E-05	4.41E-05
424	5.19E-07	1.48E-06	1.30E-05	1.94E-05		628	8.54E-07	5.15E-06	2.03E-05	4.32E-05
428	1.75E-06	1.80E-06	2.61E-05	2.12E-05		632	2.30E-07	4.68E-06	1.47E-05	4.17E-05
432	5.75E-06	2.02E-06	6.55E-05	2.36E-05		636	3.94E-08	4.81E-06	6.55E-06	4.09E-05
436	7.63E-06	2.33E-06	8.29E-05	2.51E-05		640	4.03E-08	4.81E-06	2.88E-06	4.03E-05
440	5.22E-06	2.60E-06	5.46E-05	2.68E-05		644	4.15E-08	4.34E-06	3.18E-06	3.97E-05
444	3.10E-06	2.70E-06	3.54E-05	2.76E-05		648	4.29E-08	4.40E-06	5.19E-06	4.05E-05
448	2.60E-06	3.20E-06	3.28E-05	2.89E-05		652	4.45E-08	4.13E-06	5.55E-06	4.05E-05
452	2.33E-06	3.64E-06	3.20E-05	3.10E-05		656	4.62E-08	4.09E-06	3.60E-06	4.04E-05
456	2.10E-06	3.94E-06	3.07E-05	3.27E-05		660	4.79E-08	4.17E-06	3.14E-06	3.99E-05
460	1.99E-06	4.61E-06	2.94E-05	3.51E-05		664	4.96E-08	4.46E-06	3.10E-06	3.95E-05
464	1.90E-06	4.72E-06	2.82E-05	3.69E-05		668	5.11E-08	3.87E-06	3.01E-06	3.83E-05
468	1.78E-06	4.96E-06	2.64E-05	3.82E-05		672	5.25E-08	3.76E-06	1.95E-06	3.66E-05
472	1.69E-06	5.20E-06	2.58E-05	3.93E-05		676	5.40E-08	3.32E-06	1.38E-06	3.49E-05
476	1.79E-06	5.17E-06	2.57E-05	4.02E-05		680	5.56E-08	2.73E-06	1.29E-06	3.24E-05
480	2.48E-06	5.10E-06	3.42E-05	4.23E-05		684	5.73E-08	2.42E-06	1.74E-06	3.04E-05
484	4.65E-06	5.21E-06	5.24E-05	4.44E-05		688	5.92E-08	2.39E-06	2.18E-06	2.81E-05
488	5.62E-06	5.86E-06	6.37E-05	4.69E-05		692	6.12E-08	2.00E-06	1.56E-06	2.55E-05
492	5.18E-06	6.16E-06	5.79E-05	4.91E-05		696	6.40E-08	1.62E-06	4.18E-07	2.39E-05
496	3.78E-06	6.73E-06	4.38E-05	5.04E-05		700	6.74E-08	9.50E-07	2.60E-07	2.18E-05
500	1.95E-06	6.88E-06	2.88E-05	5.08E-05		704	7.09E-08	7.97E-07	3.23E-06	1.99E-05
504	1.29E-06	7.26E-06	2.00E-05	5.14E-05		708	7.50E-08	2.64E-07	7.05E-06	1.81E-05
508	5.83E-07	7.11E-06	1.63E-05	5.22E-05		712	8.05E-08	8.05E-08	5.58E-06	1.59E-05
512	3.26E-07	7.50E-06	1.48E-05	5.36E-05		716	8.59E-08	8.59E-08	1.10E-06	1.61E-05
516	3.19E-07	7.86E-06	1.33E-05	5.53E-05		720	9.16E-08	9.16E-08	9.16E-08	1.54E-05
520	4.12E-07	8.40E-06	1.16E-05	5.73E-05		724	9.77E-08	9.77E-08	9.77E-08	1.46E-05
524	3.39E-08	8.52E-06	1.03E-05	5.87E-05		728	1.04E-07	1.04E-07	1.04E-07	1.28E-05
528	3.43E-08	8.80E-06	1.02E-05	5.96E-05		732	1.10E-07	1.10E-07	1.10E-07	1.27E-05
532	3.69E-07	8.89E-06	1.31E-05	6.01E-05		736	1.17E-07	1.17E-07	1.17E-07	1.26E-05
536	2.97E-06	8.92E-06	3.78E-05	6.00E-05		740	1.23E-07	1.23E-07	1.23E-07	1.18E-05
540	1.11E-05	8.76E-06	1.20E-04	5.97E-05		744	1.30E-07	1.30E-07	1.30E-07	1.14E-05
544	1.75E-05	9.25E-06	1.79E-04	5.98E-05		748	1.38E-07	1.38E-07	1.38E-07	1.06E-05
548	1.15E-05	9.12E-06	1.18E-04	6.02E-05		752	1.46E-07	1.46E-07	1.46E-07	8.40E-06
552	4.82E-06	9.09E-06	5.29E-05	6.10E-05		756	1.57E-07	1.57E-07	1.57E-07	7.65E-06
556	1.40E-06	8.95E-06	2.01E-05	6.11E-05		760	1.71E-07	1.71E-07	1.71E-07	9.52E-06
560	1.72E-07	8.83E-06	7.75E-06	6.11E-05		764	1.85E-07	1.85E-07	1.85E-07	6.67E-06
564	3.31E-08	8.42E-06	4.39E-06	6.00E-05		768	2.01E-07	2.01E-07	2.01E-07	5.56E-06
568	3.34E-08	8.07E-06	3.68E-06	5.85E-05		772	2.24E-07	2.24E-07	2.24E-07	1.73E-06
572	3.34E-08	7.69E-06	5.91E-06	5.67E-05		776	2.47E-07	2.47E-07	2.47E-07	5.25E-07
576	3.56E-07	7.51E-06	1.46E-05	5.51E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.74E-06	7.32E-06	2.75E-05	5.35E-05						

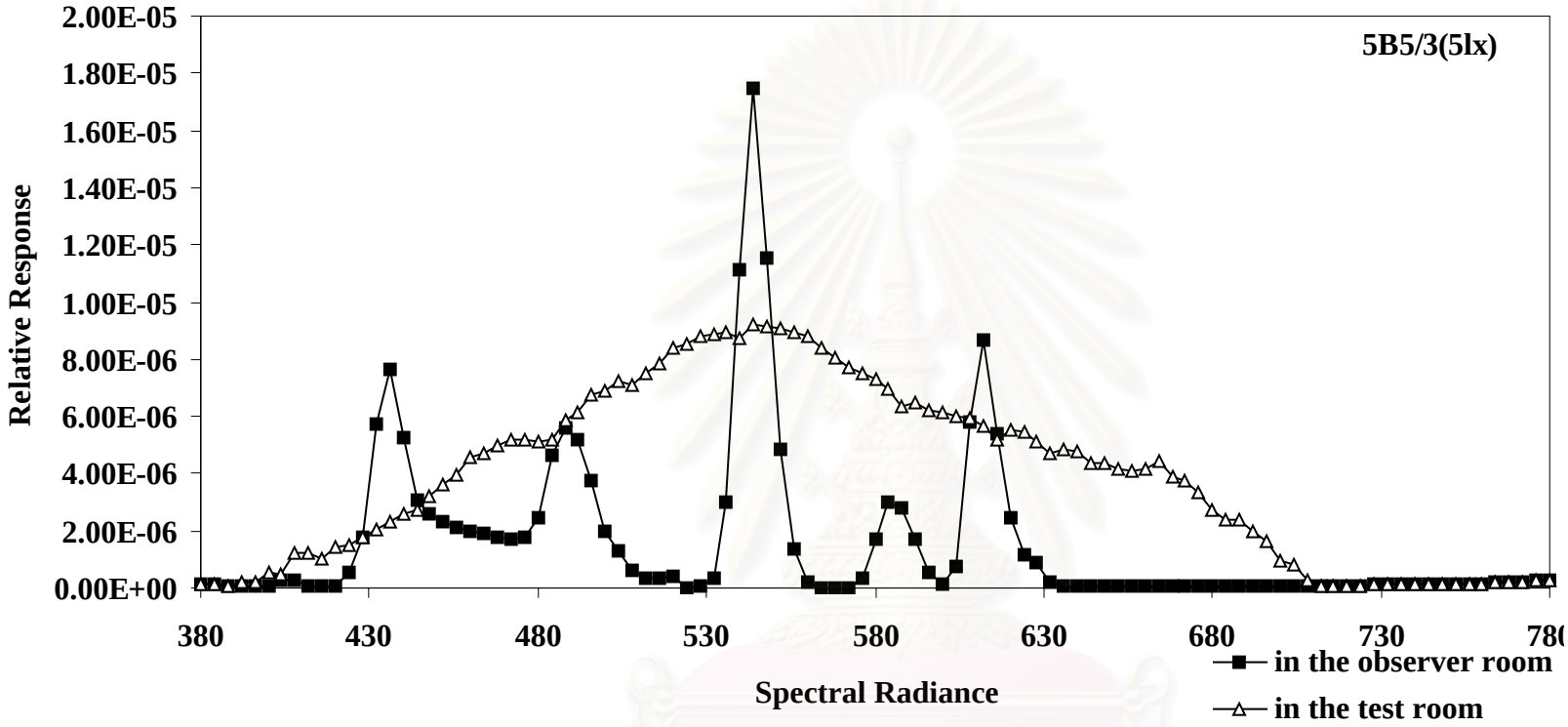


Fig.F-37a Compairison between the spatral of the color chart 5B5/3 measured at the border of RVSI
in the test room and at 5 lux in the observer room.

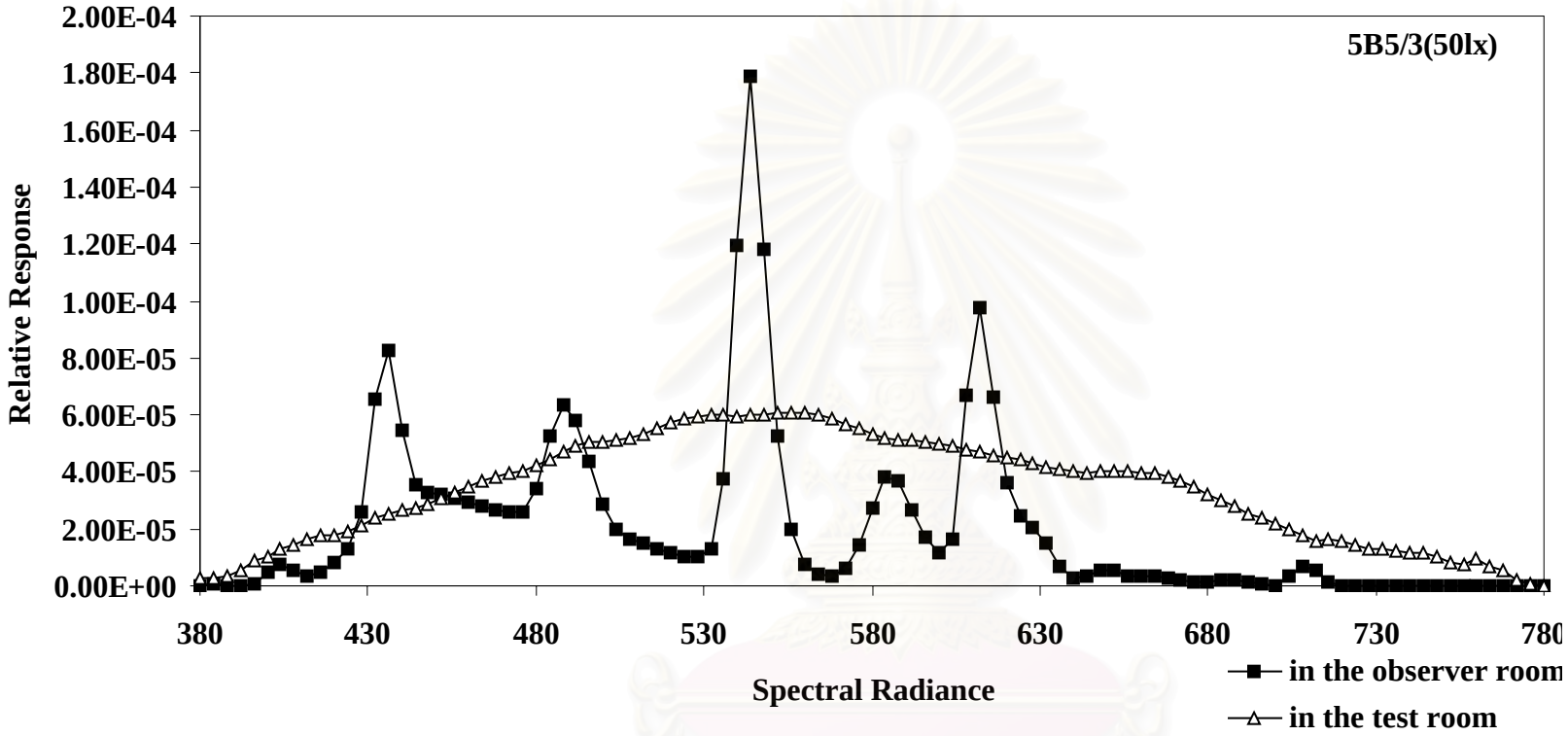


Fig.F-37b Compairison between the spatral of the color chart 5B5/3 measured at the border of RVSI in the test room and at 50lux in the observer room

Table F-38 The spectral distribution data of 5P5/3 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	6.02E-07	1.57E-06		584	3.67E-06	8.15E-06	4.82E-05	5.80E-05
384	1.09E-07	1.09E-07	5.32E-07	1.28E-06		588	4.00E-06	8.76E-06	4.88E-05	6.02E-05
388	9.16E-08	9.16E-08	3.66E-07	3.06E-06		592	2.62E-06	9.23E-06	3.64E-05	6.21E-05
392	7.96E-08	7.96E-08	9.36E-08	5.66E-06		596	1.29E-06	9.45E-06	2.44E-05	6.41E-05
396	8.82E-08	7.47E-08	7.36E-07	7.06E-06		600	6.39E-07	9.56E-06	1.77E-05	6.52E-05
400	1.17E-07	1.93E-07	5.31E-06	8.82E-06		604	1.11E-06	9.45E-06	2.42E-05	6.61E-05
404	6.21E-08	3.30E-07	8.57E-06	1.13E-05		608	9.00E-06	9.71E-06	9.90E-05	6.56E-05
408	5.81E-08	3.01E-07	6.11E-06	1.35E-05		612	1.37E-05	9.20E-06	1.45E-04	6.40E-05
412	5.67E-08	9.65E-07	4.40E-06	1.47E-05		616	9.10E-06	9.14E-06	9.87E-05	6.29E-05
416	5.58E-08	1.41E-06	5.57E-06	1.60E-05		620	4.49E-06	9.16E-06	5.41E-05	6.17E-05
420	3.33E-07	1.09E-06	8.51E-06	1.68E-05		624	2.48E-06	9.08E-06	3.70E-05	6.01E-05
424	1.26E-07	1.02E-06	1.31E-05	1.78E-05		628	1.52E-06	8.59E-06	3.08E-05	5.92E-05
428	1.30E-06	1.90E-06	2.64E-05	1.94E-05		632	8.99E-07	8.30E-06	2.28E-05	5.79E-05
432	5.38E-06	2.07E-06	6.66E-05	2.09E-05		636	1.71E-07	8.33E-06	1.10E-05	5.70E-05
436	7.49E-06	1.96E-06	8.44E-05	2.21E-05		640	4.03E-08	8.09E-06	5.61E-06	5.68E-05
440	4.69E-06	2.04E-06	5.56E-05	2.34E-05		644	4.15E-08	7.65E-06	5.54E-06	5.69E-05
444	2.67E-06	2.69E-06	3.57E-05	2.41E-05		648	4.29E-08	8.02E-06	8.26E-06	5.71E-05
448	2.49E-06	2.52E-06	3.23E-05	2.50E-05		652	4.45E-08	8.15E-06	8.20E-06	5.74E-05
452	2.55E-06	2.88E-06	3.19E-05	2.67E-05		656	4.62E-08	8.06E-06	5.90E-06	5.69E-05
456	2.06E-06	3.27E-06	3.07E-05	2.84E-05		660	4.79E-08	7.64E-06	5.14E-06	5.60E-05
460	1.93E-06	3.70E-06	2.93E-05	2.99E-05		664	4.96E-08	7.90E-06	5.91E-06	5.49E-05
464	1.76E-06	4.47E-06	2.78E-05	3.15E-05		668	5.11E-08	7.46E-06	4.93E-06	5.33E-05
468	2.07E-06	4.42E-06	2.63E-05	3.18E-05		672	5.25E-08	7.10E-06	3.90E-06	5.22E-05
472	1.74E-06	4.58E-06	2.53E-05	3.26E-05		676	5.40E-08	6.98E-06	3.79E-06	4.99E-05
476	1.59E-06	4.32E-06	2.47E-05	3.31E-05		680	5.56E-08	6.42E-06	4.32E-06	4.75E-05
480	2.52E-06	4.56E-06	3.17E-05	3.41E-05		684	5.73E-08	6.03E-06	3.77E-06	4.55E-05
484	4.09E-06	5.07E-06	4.80E-05	3.51E-05		688	5.92E-08	5.29E-06	3.57E-06	4.23E-05
488	4.87E-06	5.16E-06	5.77E-05	3.67E-05		692	6.12E-08	4.65E-06	2.92E-06	3.95E-05
492	4.29E-06	5.09E-06	5.18E-05	3.79E-05		696	6.40E-08	3.89E-06	5.73E-07	3.75E-05
496	2.98E-06	5.04E-06	3.87E-05	3.77E-05		700	6.74E-08	3.86E-06	1.46E-06	3.57E-05
500	1.15E-06	5.04E-06	2.49E-05	3.73E-05		704	7.09E-08	3.92E-06	7.78E-06	3.33E-05
504	1.32E-07	5.35E-06	1.71E-05	3.71E-05		708	7.50E-08	3.66E-06	1.51E-05	3.09E-05
508	1.68E-07	5.30E-06	1.37E-05	3.72E-05		712	8.05E-08	2.63E-06	1.21E-05	2.92E-05
512	3.38E-08	4.89E-06	1.20E-05	3.76E-05		716	8.59E-08	1.30E-06	3.38E-06	2.76E-05
516	3.37E-08	5.11E-06	1.07E-05	3.79E-05		720	9.16E-08	4.51E-07	9.16E-08	2.59E-05
520	3.36E-08	5.19E-06	9.26E-06	3.87E-05		724	9.77E-08	4.44E-07	9.77E-08	2.36E-05
524	3.39E-08	5.36E-06	8.02E-06	3.88E-05		728	1.04E-07	1.04E-07	1.04E-07	2.23E-05
528	3.43E-08	5.59E-06	7.43E-06	3.94E-05		732	1.10E-07	1.10E-07	1.10E-07	2.01E-05
532	5.10E-08	5.74E-06	1.01E-05	3.97E-05		736	1.17E-07	1.17E-07	1.17E-07	1.88E-05
536	2.22E-06	6.02E-06	3.04E-05	3.99E-05		740	1.23E-07	1.23E-07	1.23E-07	1.69E-05
540	9.02E-06	6.06E-06	9.61E-05	4.05E-05		744	1.30E-07	1.30E-07	1.30E-07	1.56E-05
544	1.40E-05	6.45E-06	1.44E-04	4.09E-05		748	1.38E-07	1.38E-07	1.38E-07	1.46E-05
548	9.29E-06	6.69E-06	9.61E-05	4.23E-05		752	1.46E-07	1.46E-07	1.46E-07	1.31E-05
552	3.93E-06	6.67E-06	4.37E-05	4.39E-05		756	1.57E-07	1.57E-07	1.57E-07	9.05E-06
556	1.13E-06	6.89E-06	1.75E-05	4.52E-05		760	1.71E-07	1.71E-07	1.71E-07	8.63E-06
560	1.46E-07	7.03E-06	7.62E-06	4.67E-05		764	1.85E-07	1.85E-07	1.85E-07	7.09E-06
564	3.31E-08	7.36E-06	4.82E-06	4.81E-05		768	2.01E-07	2.01E-07	2.01E-07	4.95E-06
568	3.34E-08	7.81E-06	4.44E-06	5.05E-05		772	2.24E-07	2.24E-07	2.24E-07	1.43E-06
572	7.11E-08	7.74E-06	7.34E-06	5.26E-05		776	2.47E-07	2.47E-07	2.47E-07	6.64E-07
576	8.49E-07	7.95E-06	1.75E-05	5.45E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	2.46E-06	8.18E-06	3.34E-05	5.61E-05						

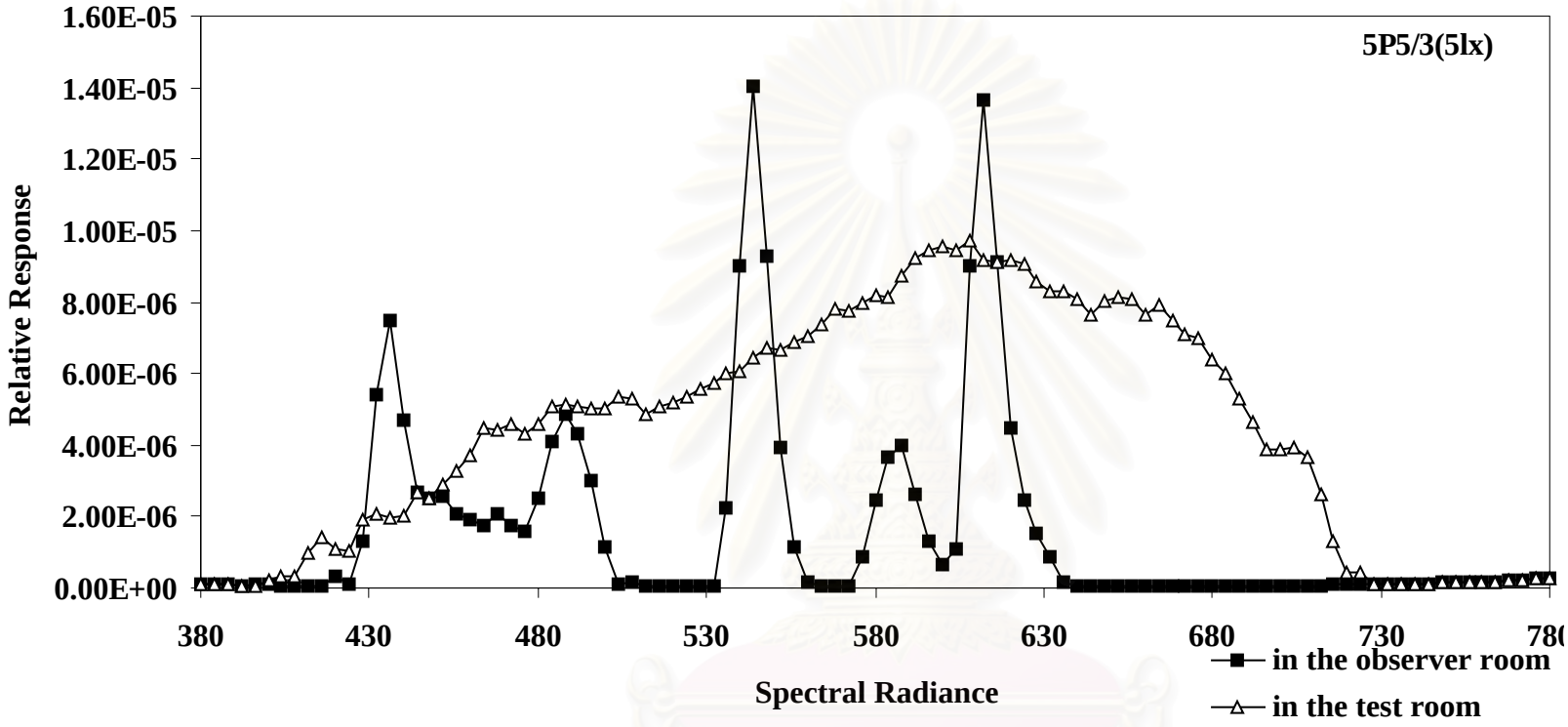


Fig.F-38a Compairison between the spatral of the color chart 5P5/3 measured at the border of RVSI in the test room and at 5 lux in the observer room.

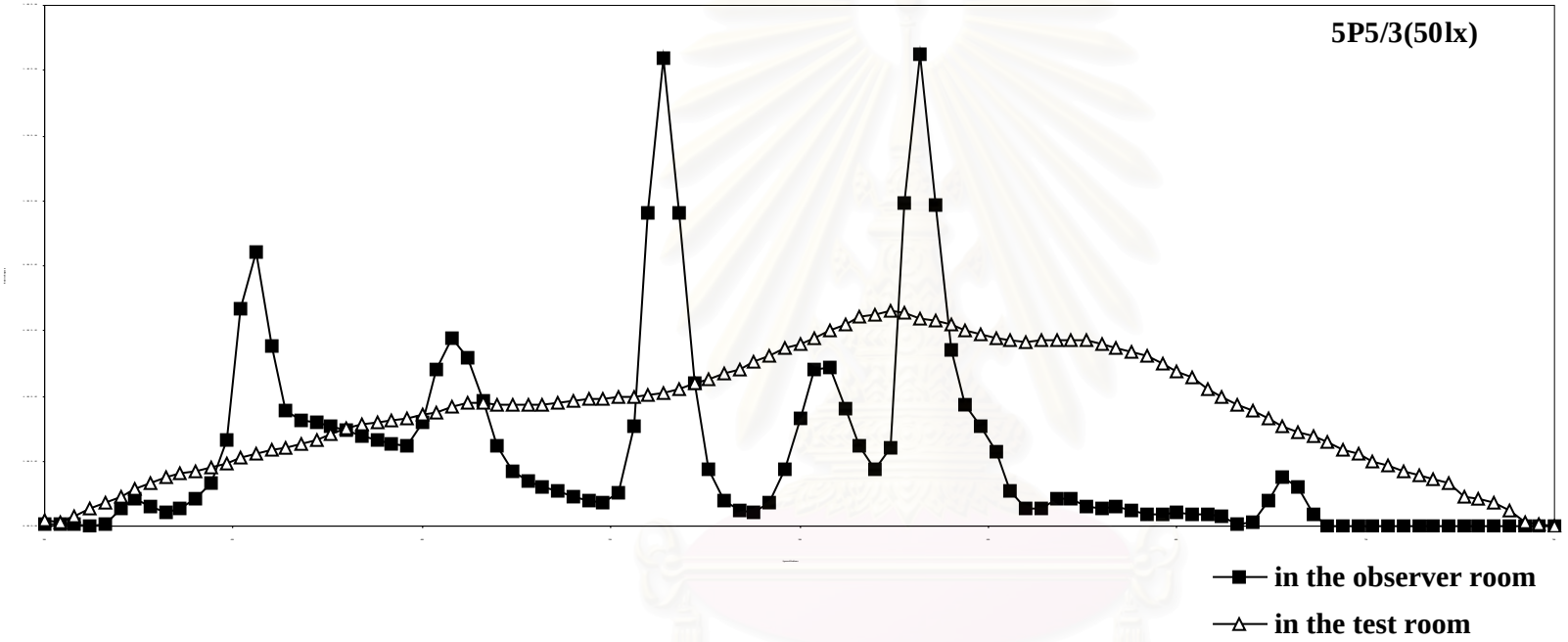


Fig.F-38b Compairison between the spatral of the color chart 5P5/3 measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-39 The spectral distribution data of N5 for 5lux and 50lux.

	IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx			IN OR.5lx	IN TR.5lx	IN OR.50lx	IN TR.50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	2.43E-07	7.59E-07	2.11E-07	2.29E-06		584	3.33E-06	9.70E-06	4.17E-05	5.93E-05
384	1.86E-07	3.66E-07	1.52E-07	2.74E-06		588	3.65E-06	9.57E-06	4.21E-05	5.96E-05
388	1.08E-07	9.16E-08	1.20E-07	3.33E-06		592	2.58E-06	9.91E-06	3.15E-05	6.03E-05
392	7.96E-08	7.96E-08	9.74E-08	5.21E-06		596	1.40E-06	9.98E-06	2.02E-05	6.12E-05
396	1.56E-07	7.47E-08	8.61E-08	7.51E-06		600	7.10E-07	1.03E-05	1.39E-05	6.17E-05
400	4.60E-07	1.51E-07	1.28E-06	8.41E-06		604	8.66E-07	1.03E-05	1.89E-05	6.25E-05
404	2.41E-07	5.73E-07	3.79E-06	9.81E-06		608	7.61E-06	1.01E-05	8.28E-05	6.23E-05
408	5.81E-08	7.76E-07	2.41E-06	1.12E-05		612	1.19E-05	9.67E-06	1.25E-04	6.15E-05
412	5.67E-08	8.32E-07	7.50E-07	1.24E-05		616	7.64E-06	9.69E-06	8.71E-05	6.09E-05
416	1.00E-07	8.04E-07	1.23E-06	1.34E-05		620	4.05E-06	9.67E-06	4.83E-05	6.00E-05
420	5.77E-08	7.19E-07	3.93E-06	1.42E-05		624	1.76E-06	9.44E-06	3.21E-05	5.84E-05
424	8.40E-08	1.21E-06	7.54E-06	1.45E-05		628	1.54E-06	9.22E-06	2.59E-05	5.75E-05
428	1.04E-06	1.30E-06	1.68E-05	1.68E-05		632	7.82E-07	8.96E-06	1.89E-05	5.61E-05
432	4.74E-06	1.43E-06	4.44E-05	1.80E-05		636	1.27E-07	8.85E-06	8.05E-06	5.46E-05
436	6.23E-06	2.02E-06	5.72E-05	1.91E-05		640	4.03E-08	8.64E-06	2.34E-06	5.36E-05
440	4.00E-06	2.04E-06	3.88E-05	1.99E-05		644	4.15E-08	8.05E-06	2.83E-06	5.25E-05
444	2.21E-06	2.16E-06	2.50E-05	2.07E-05		648	4.29E-08	8.23E-06	4.78E-06	5.21E-05
448	1.55E-06	2.85E-06	2.24E-05	2.17E-05		652	4.45E-08	8.31E-06	4.45E-06	5.13E-05
452	1.82E-06	3.17E-06	2.20E-05	2.29E-05		656	4.62E-08	8.09E-06	2.37E-06	5.06E-05
456	2.31E-06	2.82E-06	2.15E-05	2.47E-05		660	4.79E-08	7.22E-06	1.65E-06	4.95E-05
460	1.80E-06	3.40E-06	2.04E-05	2.62E-05		664	4.96E-08	7.05E-06	2.31E-06	4.75E-05
464	1.34E-06	4.13E-06	1.94E-05	2.73E-05		668	5.11E-08	6.59E-06	1.70E-06	4.59E-05
468	1.34E-06	4.40E-06	1.83E-05	2.82E-05		672	5.25E-08	5.88E-06	8.47E-07	4.42E-05
472	1.02E-06	4.33E-06	1.75E-05	2.88E-05		676	5.40E-08	5.52E-06	1.37E-07	4.25E-05
476	4.98E-07	4.18E-06	1.79E-05	2.96E-05		680	5.56E-08	4.84E-06	5.72E-08	4.05E-05
480	1.98E-06	4.31E-06	2.38E-05	3.09E-05		684	5.73E-08	4.74E-06	5.89E-08	3.83E-05
484	3.33E-06	4.87E-06	3.82E-05	3.28E-05		688	5.92E-08	4.41E-06	2.12E-07	3.61E-05
488	4.28E-06	5.03E-06	4.74E-05	3.44E-05		692	6.12E-08	3.56E-06	1.09E-07	3.39E-05
492	4.17E-06	5.51E-06	4.36E-05	3.57E-05		696	6.40E-08	3.07E-06	6.59E-08	3.17E-05
496	2.97E-06	5.92E-06	3.26E-05	3.69E-05		700	6.74E-08	3.43E-06	6.94E-08	3.03E-05
500	1.45E-06	6.02E-06	2.06E-05	3.80E-05		704	7.09E-08	3.02E-06	3.31E-06	2.85E-05
504	1.11E-06	6.00E-06	1.41E-05	3.85E-05		708	7.50E-08	2.58E-06	9.86E-06	2.67E-05
508	9.90E-07	6.24E-06	1.08E-05	3.92E-05		712	8.05E-08	1.01E-06	6.26E-06	2.49E-05
512	6.97E-07	6.12E-06	9.67E-06	4.05E-05		716	8.59E-08	6.98E-07	1.08E-06	2.28E-05
516	4.59E-07	6.53E-06	8.68E-06	4.20E-05		720	9.16E-08	2.54E-07	9.44E-08	2.16E-05
520	1.87E-07	6.89E-06	7.34E-06	4.37E-05		724	9.77E-08	1.15E-07	1.01E-07	2.08E-05
524	3.39E-08	7.14E-06	6.76E-06	4.55E-05		728	1.04E-07	1.04E-07	1.08E-07	1.86E-05
528	6.87E-08	7.42E-06	6.19E-06	4.65E-05		732	1.10E-07	1.10E-07	1.14E-07	1.69E-05
532	2.88E-07	7.53E-06	8.86E-06	4.75E-05		736	1.17E-07	1.17E-07	1.21E-07	1.45E-05
536	2.72E-06	7.92E-06	2.99E-05	4.80E-05		740	1.23E-07	1.23E-07	1.27E-07	1.29E-05
540	1.02E-05	8.32E-06	9.93E-05	4.88E-05		744	1.30E-07	1.30E-07	1.35E-07	1.12E-05
544	1.62E-05	8.64E-06	1.51E-04	4.97E-05		748	1.38E-07	1.38E-07	1.42E-07	1.03E-05
548	1.03E-05	9.02E-06	1.03E-04	5.13E-05		752	1.46E-07	1.46E-07	1.51E-07	9.64E-06
552	4.55E-06	9.17E-06	4.71E-05	5.34E-05		756	1.57E-07	1.57E-07	1.63E-07	6.99E-06
556	1.04E-06	9.20E-06	1.74E-05	5.49E-05		760	1.71E-07	1.71E-07	1.76E-07	5.10E-06
560	3.27E-08	9.89E-06	6.17E-06	5.70E-05		764	1.85E-07	1.85E-07	1.91E-07	4.43E-06
564	3.31E-08	1.01E-05	3.17E-06	5.84E-05		768	2.01E-07	2.01E-07	2.08E-07	3.26E-06
568	3.34E-08	9.92E-06	2.26E-06	5.90E-05		772	2.24E-07	2.24E-07	2.31E-07	1.80E-06
572	3.34E-08	9.80E-06	4.18E-06	5.91E-05		776	2.47E-07	2.47E-07	2.56E-07	2.47E-07
576	6.60E-07	9.68E-06	1.36E-05	5.91E-05		780	2.77E-07	2.77E-07	2.87E-07	2.77E-07
580	2.11E-06	9.61E-06	2.87E-05	5.88E-05						

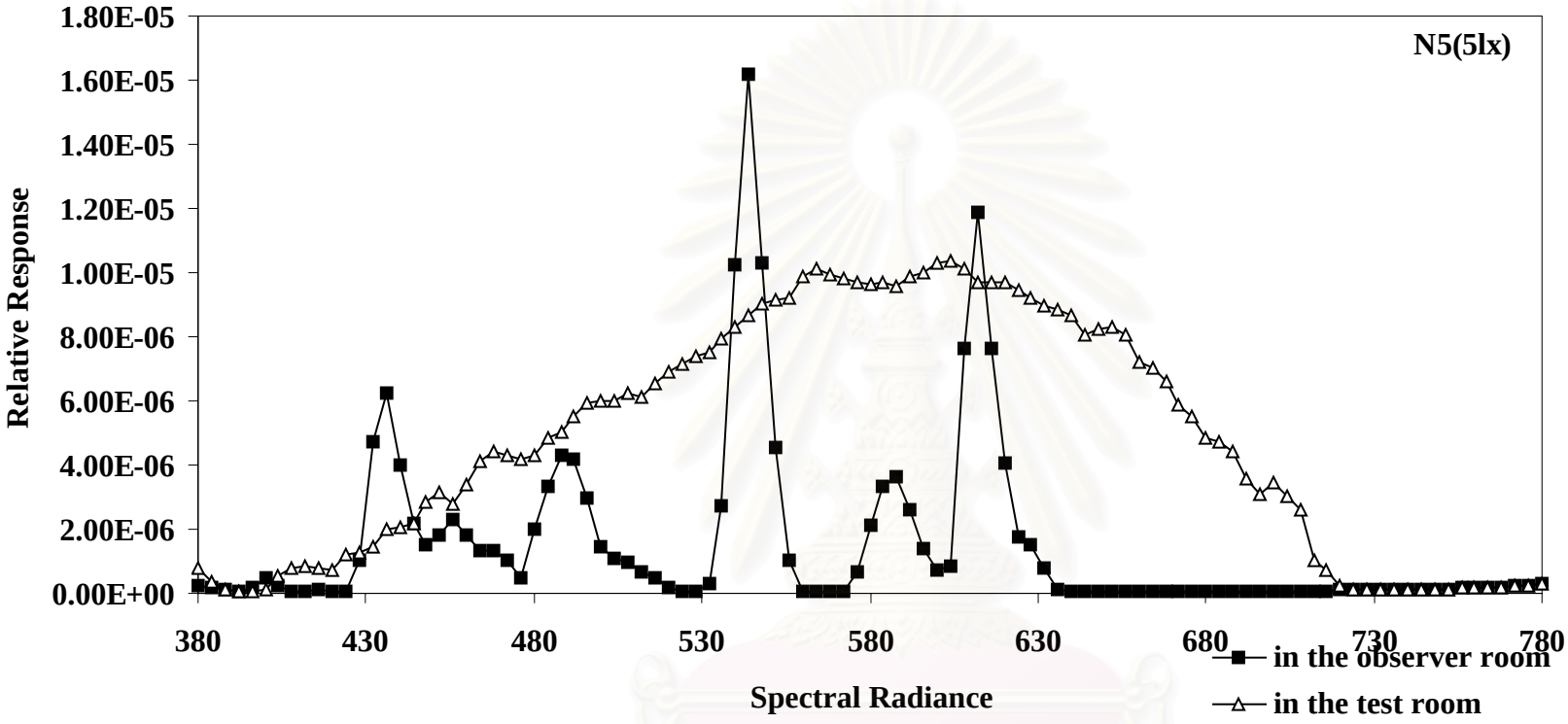


Fig.F-39a Compairison between the spatral of the color chart 5N measured at the border of RVSI in the test room and at 5 lux in the observer room

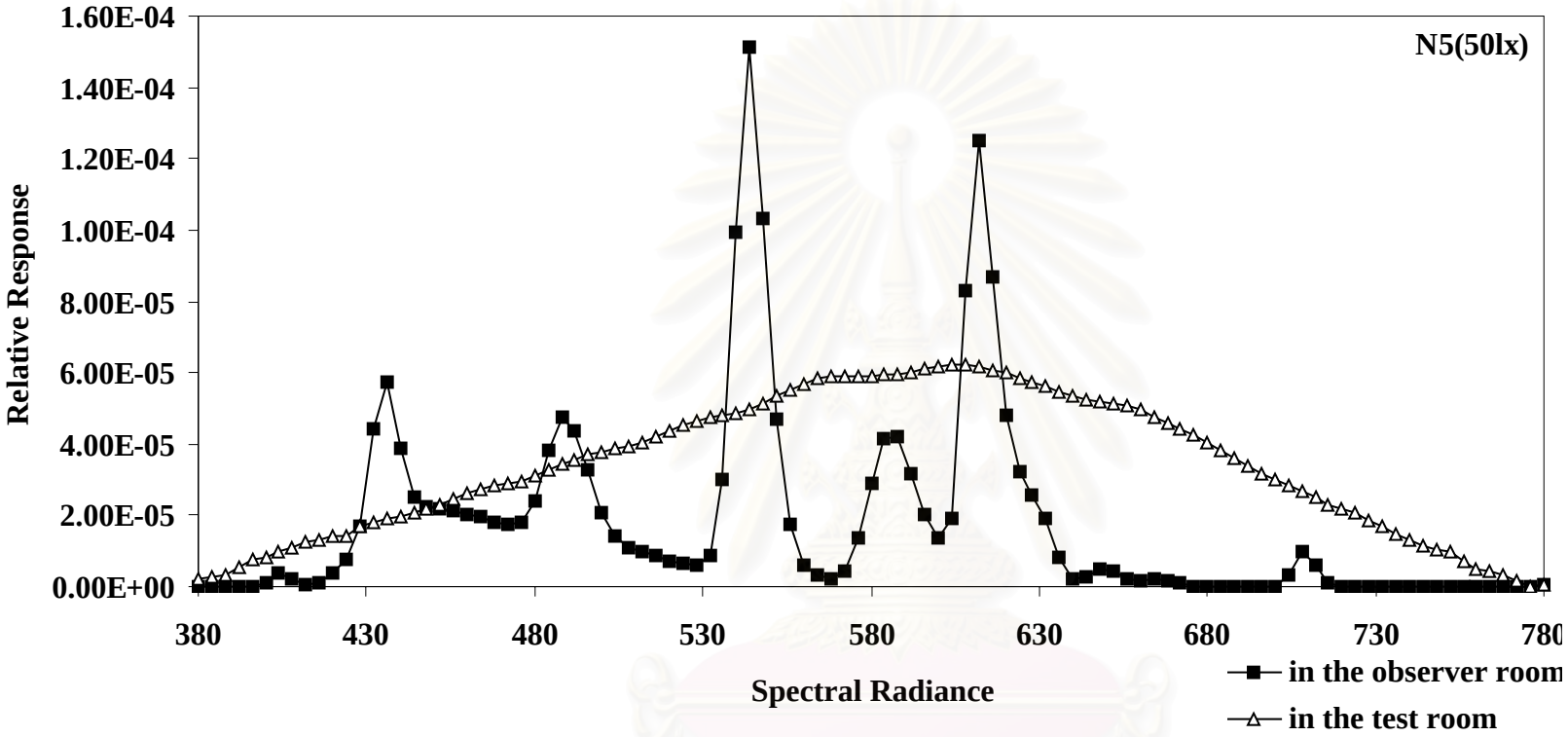


Fig.F-39b Compairison between the spatral of the color chart 5N measured at the border of RVSI in the test room and at 50lux in the observer room.

Table F-40 The spectral distribution data of N7 for 5lux and 50lux.

	IN OR.5lx	IN OR.50lx		IN OR.5lx	IN OR.50lx
(nm)	w/sr*m2	w/sr*m2	(nm)	w/sr*m2	w/sr*m2
380	1.33E-07	4.19E-07	584	8.75E-06	9.12E-05
384	1.09E-07	2.14E-07	588	8.52E-06	9.19E-05
388	2.42E-07	1.68E-07	592	6.15E-06	6.88E-05
392	8.90E-08	1.37E-07	596	3.93E-06	4.53E-05
396	7.47E-08	8.85E-07	600	2.53E-06	3.23E-05
400	3.17E-07	6.83E-06	604	3.48E-06	4.36E-05
404	9.13E-07	1.13E-05	608	1.79E-05	1.77E-04
408	4.81E-07	7.59E-06	612	2.68E-05	2.65E-04
412	3.22E-07	6.74E-06	616	1.84E-05	1.86E-04
416	2.25E-07	8.90E-06	620	9.77E-06	1.04E-04
420	1.24E-06	1.29E-05	624	5.83E-06	7.00E-05
424	1.48E-06	2.08E-05	628	4.87E-06	5.85E-05
428	3.25E-06	4.02E-05	632	3.13E-06	4.34E-05
432	9.81E-06	9.76E-05	636	7.32E-07	2.12E-05
436	1.31E-05	1.24E-04	640	5.56E-08	1.01E-05
440	8.95E-06	8.56E-05	644	4.15E-08	1.00E-05
444	5.90E-06	5.75E-05	648	4.29E-08	1.41E-05
448	5.27E-06	5.11E-05	652	4.45E-08	1.45E-05
452	4.40E-06	5.04E-05	656	4.62E-08	1.01E-05
456	4.49E-06	4.86E-05	660	4.79E-08	8.89E-06
460	4.43E-06	4.68E-05	664	4.96E-08	9.32E-06
464	3.96E-06	4.45E-05	668	5.11E-08	7.99E-06
468	3.63E-06	4.27E-05	672	5.25E-08	6.49E-06
472	3.62E-06	4.12E-05	676	5.40E-08	4.95E-06
476	3.80E-06	4.13E-05	680	5.56E-08	4.82E-06
480	4.99E-06	5.39E-05	684	5.73E-08	5.82E-06
484	8.29E-06	8.32E-05	688	5.92E-08	5.93E-06
488	1.05E-05	1.03E-04	692	6.12E-08	3.96E-06
492	9.54E-06	9.41E-05	696	6.40E-08	2.19E-06
496	7.20E-06	7.18E-05	700	6.74E-08	3.21E-06
500	4.39E-06	4.70E-05	704	7.09E-08	1.34E-05
504	2.95E-06	3.28E-05	708	7.50E-08	2.60E-05
508	2.16E-06	2.64E-05	712	8.05E-08	2.06E-05
512	1.57E-06	2.37E-05	716	8.59E-08	6.50E-06
516	1.18E-06	2.20E-05	720	9.16E-08	4.91E-07
520	1.36E-06	1.89E-05	724	9.77E-08	1.42E-07
524	9.37E-07	1.70E-05	728	1.04E-07	1.51E-07
528	8.90E-07	1.62E-05	732	1.10E-07	1.60E-07
532	1.54E-06	2.22E-05	736	1.17E-07	1.70E-07
536	6.14E-06	6.63E-05	740	1.23E-07	1.79E-07
540	2.15E-05	2.10E-04	744	1.30E-07	1.89E-07
544	3.39E-05	3.19E-04	748	1.38E-07	2.00E-07
548	2.28E-05	2.19E-04	752	1.46E-07	2.13E-07
552	9.89E-06	1.02E-04	756	1.57E-07	2.29E-07
556	3.29E-06	4.04E-05	760	1.71E-07	2.48E-07
560	9.43E-07	1.63E-05	764	1.85E-07	2.68E-07
564	9.69E-08	8.86E-06	768	2.01E-07	2.92E-07
568	3.34E-08	7.74E-06	772	2.24E-07	3.25E-07
572	3.73E-07	1.31E-05	776	2.47E-07	3.60E-07
576	2.18E-06	3.30E-05	780	2.77E-07	4.03E-07
580	5.49E-06	6.36E-05			

Table F-41 The spectral distribution data of N9 for 5lux and 50lux.

	IN OR.5lx	IN OR.50lx		IN OR.5lx	IN OR.50lx
(nm)	w/sr*m2	w/sr*m2	(nm)	w/sr*m2	w/sr*m2
380	4.07E-07	1.64E-06	584	1.65E-05	1.75E-04
384	1.09E-07	4.71E-07	588	1.66E-05	1.74E-04
388	9.16E-08	1.82E-07	592	1.24E-05	1.29E-04
392	7.96E-08	2.80E-06	596	8.04E-06	8.62E-05
396	7.47E-08	1.67E-06	600	5.46E-06	6.29E-05
400	5.03E-07	1.24E-05	604	7.80E-06	8.50E-05
404	1.24E-06	2.03E-05	608	3.27E-05	3.43E-04
408	9.24E-07	1.43E-05	612	4.95E-05	5.04E-04
412	1.31E-06	1.17E-05	616	3.38E-05	3.45E-04
416	7.99E-07	1.65E-05	620	1.84E-05	1.93E-04
420	1.49E-06	2.56E-05	624	1.25E-05	1.33E-04
424	3.29E-06	3.82E-05	628	1.00E-05	1.12E-04
428	7.04E-06	7.78E-05	632	6.92E-06	8.44E-05
432	1.83E-05	1.93E-04	636	2.54E-06	4.25E-05
436	2.31E-05	2.44E-04	640	2.93E-07	2.25E-05
440	1.56E-05	1.62E-04	644	3.58E-07	2.32E-05
444	1.03E-05	1.07E-04	648	8.50E-07	3.14E-05
448	9.23E-06	9.72E-05	652	1.03E-06	3.27E-05
452	9.00E-06	9.46E-05	656	2.12E-07	2.40E-05
456	9.08E-06	9.16E-05	660	4.79E-08	2.27E-05
460	8.34E-06	8.82E-05	664	4.96E-08	2.40E-05
464	7.85E-06	8.41E-05	668	5.11E-08	2.11E-05
468	7.41E-06	8.02E-05	672	5.25E-08	1.78E-05
472	6.79E-06	7.71E-05	676	5.40E-08	1.62E-05
476	7.22E-06	7.84E-05	680	5.56E-08	1.69E-05
480	9.57E-06	1.02E-04	684	5.73E-08	1.84E-05
484	1.52E-05	1.57E-04	688	5.92E-08	1.84E-05
488	1.88E-05	1.92E-04	692	6.12E-08	1.59E-05
492	1.74E-05	1.75E-04	696	6.40E-08	1.06E-05
496	1.33E-05	1.34E-04	700	6.74E-08	1.24E-05
500	8.71E-06	8.97E-05	704	1.14E-07	3.29E-05
504	5.89E-06	6.36E-05	708	1.47E-06	5.83E-05
508	4.44E-06	5.19E-05	712	5.26E-07	4.91E-05
512	3.75E-06	4.70E-05	716	8.59E-08	2.36E-05
516	3.61E-06	4.29E-05	720	9.16E-08	7.48E-06
520	3.02E-06	3.91E-05	724	9.77E-08	1.65E-06
524	2.67E-06	3.45E-05	728	1.04E-07	4.44E-07
528	2.65E-06	3.38E-05	732	1.10E-07	8.34E-07
532	3.61E-06	4.46E-05	736	1.17E-07	3.82E-07
536	1.18E-05	1.28E-04	740	1.23E-07	1.24E-06
540	3.93E-05	4.02E-04	744	1.30E-07	4.00E-07
544	6.05E-05	6.04E-04	748	1.38E-07	6.85E-07
548	4.10E-05	4.05E-04	752	1.46E-07	3.77E-07
552	1.83E-05	1.87E-04	756	1.57E-07	7.94E-07
556	6.76E-06	7.45E-05	760	1.71E-07	4.17E-06
560	2.36E-06	3.17E-05	764	1.85E-07	1.97E-06
564	1.03E-06	1.98E-05	768	2.01E-07	3.98E-07
568	2.03E-07	1.80E-05	772	2.24E-07	4.44E-07
572	1.32E-06	2.95E-05	776	2.47E-07	7.04E-07
576	5.10E-06	6.67E-05	780	2.77E-07	2.54E-06
580	1.12E-05	1.25E-04			

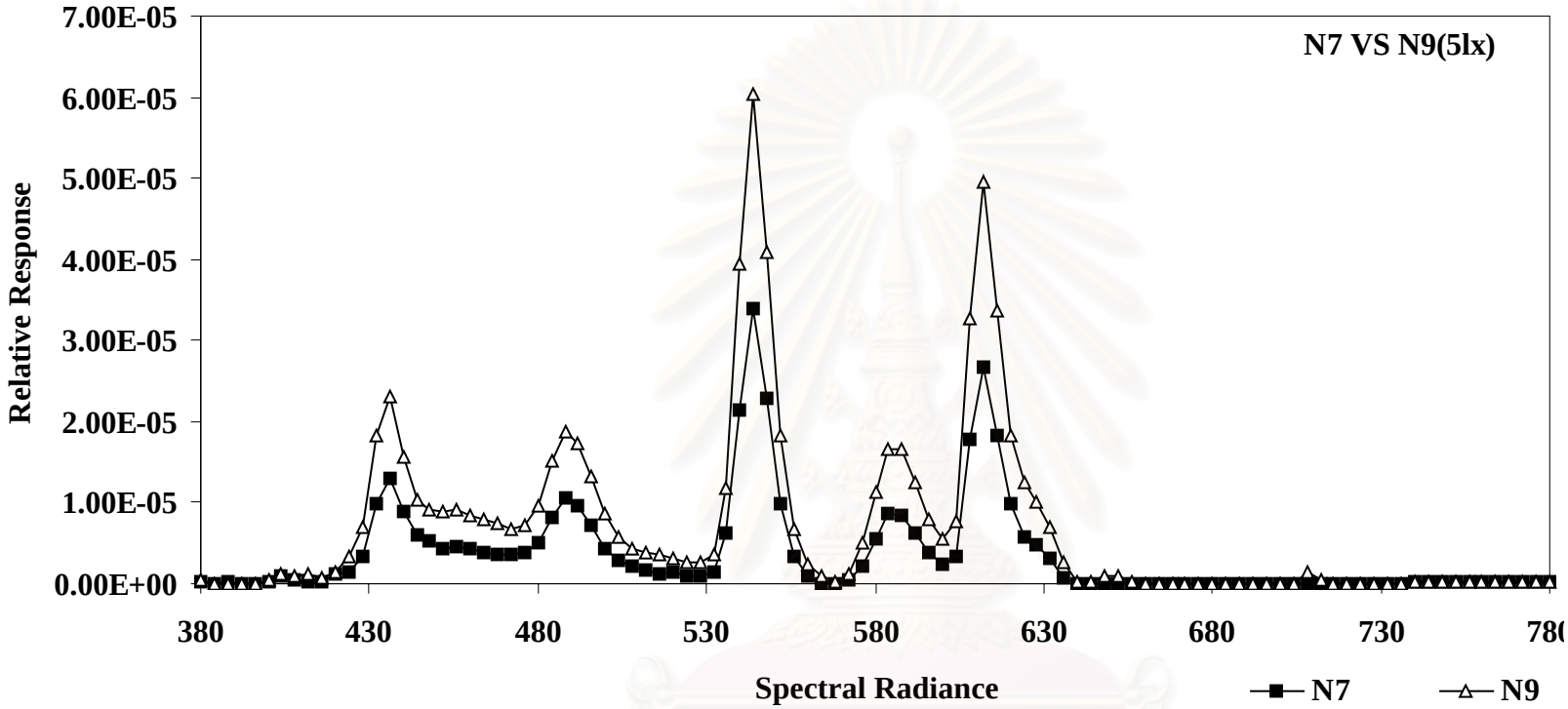


Fig.F-40a Compairison between the spatral of the color chart N7 and N9 measured at 5lux in the observer room.

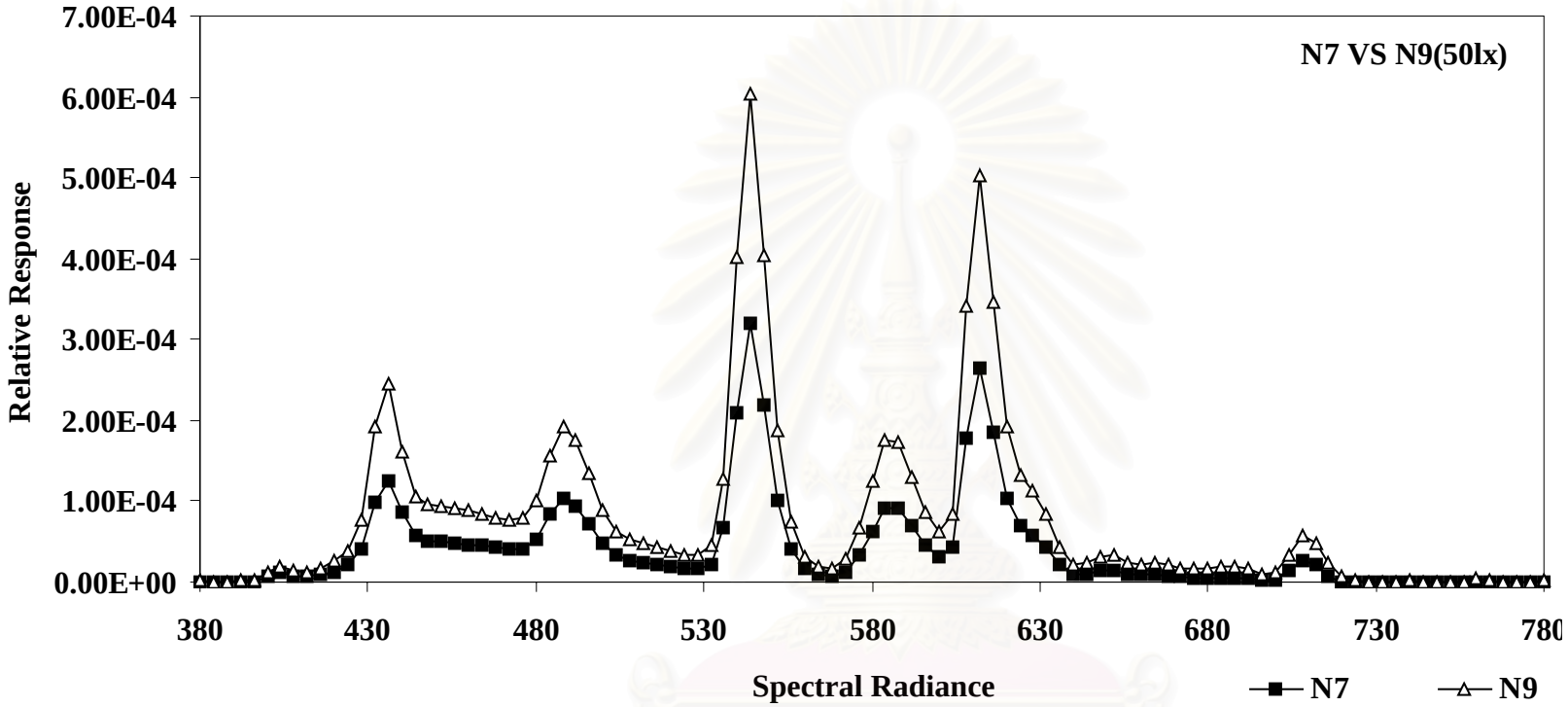


Fig.F-40b Compairison between the spatral of the color chart N7 and N9 measured at 50lux in the observer room.

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	wall		Reddall				wall		Reddall	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	3.86E-07	1.33E-07	1.33E-07		584	1.62E-05	1.74E-04	1.18E-06	2.10E-05
384	1.09E-07	2.44E-06	1.09E-07	1.09E-07		588	1.63E-05	1.74E-04	1.59E-06	2.45E-05
388	9.16E-08	1.43E-06	9.16E-08	9.19E-08		592	1.19E-05	1.30E-04	1.38E-06	2.16E-05
392	7.96E-08	2.12E-07	7.96E-08	7.99E-08		596	7.28E-06	8.83E-05	6.62E-07	1.81E-05
396	1.02E-07	1.82E-06	7.47E-08	7.50E-08		600	4.82E-06	6.49E-05	1.70E-07	1.62E-05
400	6.81E-07	1.29E-05	6.86E-08	1.06E-06		604	7.16E-06	8.63E-05	1.76E-06	3.21E-05
404	1.43E-06	2.06E-05	6.21E-08	3.21E-06		608	3.27E-05	3.42E-04	1.43E-05	1.55E-04
408	5.97E-07	1.51E-05	5.81E-08	2.09E-06		612	4.92E-05	5.06E-04	2.29E-05	2.39E-04
412	2.08E-07	1.14E-05	5.67E-08	1.14E-06		616	3.36E-05	3.53E-04	1.69E-05	1.80E-04
416	1.29E-06	1.51E-05	5.58E-08	1.47E-06		620	1.79E-05	2.00E-04	1.07E-05	1.18E-04
420	1.22E-06	2.28E-05	5.33E-08	2.23E-06		624	1.19E-05	1.37E-04	8.36E-06	9.51E-05
424	2.97E-06	3.50E-05	5.01E-08	3.40E-06		628	9.69E-06	1.16E-04	7.68E-06	9.09E-05
428	6.40E-06	7.05E-05	2.33E-07	6.14E-06		632	7.01E-06	8.81E-05	5.85E-06	7.25E-05
432	1.61E-05	1.70E-04	6.95E-07	1.47E-05		636	2.53E-06	4.46E-05	2.50E-06	3.82E-05
436	2.02E-05	2.15E-04	6.34E-07	1.82E-05		640	4.58E-07	2.47E-05	9.36E-07	2.15E-05
440	1.39E-05	1.47E-04	2.04E-07	1.14E-05		644	2.60E-07	2.40E-05	4.10E-07	2.41E-05
444	9.16E-06	9.98E-05	4.38E-08	6.87E-06		648	1.02E-06	3.25E-05	1.43E-06	3.46E-05
448	8.54E-06	9.16E-05	4.20E-08	5.31E-06		652	9.78E-07	3.36E-05	2.05E-06	3.58E-05
452	8.84E-06	8.94E-05	4.09E-08	5.04E-06		656	1.61E-07	2.50E-05	9.23E-07	2.71E-05
456	8.90E-06	8.77E-05	4.04E-08	4.89E-06		660	9.41E-08	2.23E-05	1.14E-06	2.59E-05
460	8.05E-06	8.41E-05	4.02E-08	4.75E-06		664	4.05E-07	2.58E-05	1.50E-06	2.83E-05
464	7.81E-06	8.14E-05	3.98E-08	4.09E-06		668	5.11E-08	2.32E-05	8.79E-07	2.51E-05
468	7.22E-06	7.94E-05	3.91E-08	3.66E-06		672	5.25E-08	1.91E-05	2.65E-07	2.14E-05
472	7.06E-06	7.65E-05	3.82E-08	3.32E-06		676	5.40E-08	1.76E-05	5.40E-08	2.10E-05
476	7.38E-06	7.60E-05	3.71E-08	3.22E-06		680	5.56E-08	1.76E-05	1.08E-07	2.11E-05
480	1.03E-05	1.00E-04	3.65E-08	4.14E-06		684	5.73E-08	1.78E-05	3.11E-07	2.23E-05
484	1.55E-05	1.56E-04	3.60E-08	6.70E-06		688	5.92E-08	1.86E-05	1.71E-07	2.36E-05
488	1.93E-05	1.91E-04	9.80E-08	8.41E-06		692	6.12E-08	1.57E-05	6.12E-08	2.08E-05
492	1.74E-05	1.75E-04	6.58E-08	7.88E-06		696	6.40E-08	9.22E-06	6.40E-08	1.24E-05
496	1.29E-05	1.35E-04	3.57E-08	5.51E-06		700	6.74E-08	1.14E-05	2.05E-07	1.49E-05
500	8.41E-06	9.00E-05	3.54E-08	3.34E-06		704	1.57E-07	3.34E-05	1.24E-06	4.32E-05
504	5.47E-06	6.36E-05	3.48E-08	1.88E-06		708	1.49E-06	5.91E-05	4.17E-06	7.80E-05
508	4.31E-06	5.26E-05	3.43E-08	1.61E-06		712	6.54E-07	4.91E-05	3.82E-06	6.55E-05
512	4.11E-06	4.71E-05	3.38E-08	1.39E-06		716	8.59E-08	2.17E-05	5.92E-07	2.83E-05
516	3.38E-06	4.33E-05	3.37E-08	1.27E-06		720	9.16E-08	6.24E-06	9.16E-08	7.42E-06
520	2.85E-06	3.88E-05	3.36E-08	1.01E-06		724	9.77E-08	1.99E-06	9.77E-08	7.98E-07
524	2.44E-06	3.43E-05	3.39E-08	8.33E-07		728	1.04E-07	2.15E-07	1.04E-07	1.05E-07
528	2.36E-06	3.34E-05	3.43E-08	4.94E-07		732	1.10E-07	2.27E-07	1.10E-07	1.11E-07
532	3.44E-06	4.37E-05	3.43E-08	1.43E-06		736	1.17E-07	5.51E-07	1.17E-07	1.17E-07
536	1.14E-05	1.24E-04	3.40E-08	5.35E-06		740	1.23E-07	2.84E-06	1.23E-07	1.23E-07
540	3.85E-05	3.87E-04	1.25E-06	1.82E-05		744	1.30E-07	1.70E-06	1.30E-07	1.31E-07
544	5.85E-05	5.81E-04	2.13E-06	2.80E-05		748	1.38E-07	9.80E-07	1.38E-07	1.38E-07
548	3.92E-05	3.96E-04	1.21E-06	1.87E-05		752	1.46E-07	6.62E-07	1.46E-07	1.47E-07
552	1.78E-05	1.85E-04	3.52E-07	8.75E-06		756	1.57E-07	3.24E-07	1.57E-07	1.58E-07
556	6.39E-06	7.44E-05	1.69E-07	3.04E-06		760	1.71E-07	4.72E-07	1.71E-07	1.71E-07
560	1.92E-06	3.21E-05	3.27E-08	7.14E-07		764	1.85E-07	5.47E-07	1.85E-07	1.85E-07
564	7.40E-07	2.02E-05	3.31E-08	1.10E-07		768	2.01E-07	4.13E-07	2.01E-07	2.01E-07
568	4.29E-07	1.80E-05	3.34E-08	6.12E-07		772	2.24E-07	4.60E-07	2.24E-07	2.24E-07
572	1.11E-06	2.76E-05	3.34E-08	1.32E-06		776	2.47E-07	5.09E-07	2.47E-07	2.48E-07
576	4.67E-06	6.47E-05	3.31E-08	5.48E-06		780	2.77E-07	5.70E-07	2.77E-07	2.78E-07
580	1.04E-05	1.23E-04	1.95E-07	1.24E-05						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	faceDall		flower ping				faceDall		flower ping	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	3.90E-06	1.33E-07	6.92E-07		584	1.63E-05	1.79E-04	2.20E-06	3.66E-05
384	1.09E-07	3.31E-06	1.09E-07	1.21E-07		588	1.65E-05	1.81E-04	2.71E-06	4.53E-05
388	9.16E-08	9.74E-07	9.16E-08	1.01E-07		592	1.22E-05	1.37E-04	2.93E-06	4.35E-05
392	7.96E-08	1.63E-07	7.96E-08	2.43E-07		596	7.86E-06	9.36E-05	2.26E-06	3.93E-05
396	7.47E-08	1.54E-06	7.47E-08	8.27E-08		600	5.77E-06	6.90E-05	2.05E-06	3.67E-05
400	3.99E-07	1.10E-05	6.86E-08	6.71E-07		604	8.35E-06	9.31E-05	2.46E-06	5.03E-05
404	8.46E-07	1.71E-05	6.21E-08	1.42E-06		608	3.46E-05	3.65E-04	1.39E-05	1.64E-04
408	3.96E-07	1.18E-05	5.81E-08	7.36E-07		612	5.17E-05	5.36E-04	2.14E-05	2.40E-04
412	2.83E-07	7.97E-06	5.67E-08	5.64E-07		616	3.52E-05	3.74E-04	1.55E-05	1.77E-04
416	1.46E-07	1.04E-05	5.58E-08	1.08E-06		620	2.00E-05	2.13E-04	9.49E-06	1.12E-04
420	1.05E-07	1.58E-05	5.33E-08	1.93E-06		624	1.34E-05	1.48E-04	6.99E-06	8.55E-05
424	1.34E-06	2.41E-05	5.01E-08	3.28E-06		628	1.08E-05	1.25E-04	5.32E-06	7.72E-05
428	3.51E-06	4.46E-05	1.62E-07	8.38E-06		632	7.76E-06	9.39E-05	3.67E-06	6.22E-05
432	8.61E-06	1.05E-04	9.37E-07	2.15E-05		636	3.27E-06	4.82E-05	1.87E-06	3.81E-05
436	1.10E-05	1.31E-04	1.36E-06	2.73E-05		640	5.96E-07	2.63E-05	3.49E-07	2.56E-05
440	7.44E-06	8.80E-05	8.85E-07	1.92E-05		644	1.14E-06	2.69E-05	5.39E-07	2.59E-05
444	4.79E-06	5.74E-05	1.75E-07	1.36E-05		648	1.99E-06	3.62E-05	1.02E-06	3.14E-05
448	4.49E-06	5.21E-05	4.20E-08	1.33E-05		652	2.10E-06	3.67E-05	5.84E-07	3.16E-05
452	4.48E-06	5.07E-05	5.78E-08	1.31E-05		656	1.05E-06	2.72E-05	7.17E-08	2.52E-05
456	4.04E-06	4.84E-05	9.37E-08	1.34E-05		660	5.51E-07	2.48E-05	4.79E-08	2.34E-05
460	3.68E-06	4.53E-05	4.02E-08	1.37E-05		664	7.31E-07	2.71E-05	4.96E-08	2.34E-05
464	3.57E-06	4.34E-05	3.98E-08	1.32E-05		668	1.32E-07	2.41E-05	5.11E-08	2.11E-05
468	3.27E-06	4.13E-05	3.91E-08	1.30E-05		672	5.25E-08	2.03E-05	5.25E-08	1.85E-05
472	2.80E-06	4.01E-05	1.12E-07	1.29E-05		676	5.40E-08	1.98E-05	5.40E-08	1.71E-05
476	2.77E-06	4.00E-05	3.73E-07	1.28E-05		680	5.56E-08	2.06E-05	5.56E-08	1.69E-05
480	4.00E-06	5.29E-05	3.46E-07	1.72E-05		684	5.73E-08	2.05E-05	5.73E-08	1.74E-05
484	7.09E-06	8.19E-05	1.21E-06	2.68E-05		688	5.92E-08	2.14E-05	5.92E-08	1.73E-05
488	9.38E-06	1.01E-04	1.85E-06	3.30E-05		692	6.12E-08	1.80E-05	6.12E-08	1.49E-05
492	8.67E-06	9.24E-05	1.45E-06	3.01E-05		696	6.40E-08	1.15E-05	6.40E-08	9.01E-06
496	6.20E-06	7.19E-05	7.88E-07	2.22E-05		700	6.74E-08	1.43E-05	6.74E-08	1.11E-05
500	3.94E-06	4.81E-05	9.54E-08	1.39E-05		704	1.06E-06	3.77E-05	7.09E-08	2.79E-05
504	2.61E-06	3.49E-05	3.48E-08	9.18E-06		708	2.28E-06	6.61E-05	2.55E-07	4.87E-05
508	2.43E-06	2.94E-05	3.43E-08	6.92E-06		712	1.67E-06	5.57E-05	8.05E-08	4.17E-05
512	1.81E-06	2.74E-05	3.38E-08	5.67E-06		716	8.59E-08	2.50E-05	8.59E-08	1.85E-05
516	1.52E-06	2.50E-05	3.37E-08	4.35E-06		720	9.16E-08	6.51E-06	9.16E-08	3.56E-06
520	1.30E-06	2.30E-05	3.36E-08	3.44E-06		724	9.77E-08	6.62E-07	9.77E-08	1.87E-07
524	9.95E-07	2.17E-05	3.39E-08	2.78E-06		728	1.04E-07	3.47E-07	1.04E-07	1.15E-07
528	9.83E-07	2.24E-05	3.43E-08	2.58E-06		732	1.10E-07	6.23E-07	1.10E-07	1.22E-07
532	1.98E-06	3.07E-05	3.43E-08	3.82E-06		736	1.17E-07	2.03E-07	1.17E-07	1.29E-07
536	8.16E-06	9.24E-05	7.74E-08	1.13E-05		740	1.23E-07	1.03E-06	1.23E-07	1.36E-07
540	2.85E-05	2.95E-04	2.00E-06	3.46E-05		744	1.30E-07	1.93E-06	1.30E-07	1.44E-07
544	4.37E-05	4.50E-04	3.43E-06	5.00E-05		748	1.38E-07	3.61E-07	1.38E-07	1.52E-07
548	2.96E-05	3.09E-04	2.10E-06	3.24E-05		752	1.46E-07	2.54E-07	1.46E-07	1.62E-07
552	1.36E-05	1.48E-04	2.56E-07	1.41E-05		756	1.57E-07	2.73E-07	1.57E-07	1.74E-07
556	5.21E-06	6.31E-05	3.22E-08	5.59E-06		760	1.71E-07	2.96E-07	1.71E-07	1.89E-07
560	1.92E-06	3.01E-05	3.27E-08	2.61E-06		764	1.85E-07	3.21E-07	1.85E-07	2.04E-07
564	1.11E-06	2.08E-05	3.31E-08	2.25E-06		768	2.01E-07	3.49E-07	2.01E-07	2.22E-07
568	6.53E-07	2.03E-05	3.34E-08	3.25E-06		772	2.24E-07	3.88E-07	2.24E-07	2.48E-07
572	1.31E-06	3.09E-05	3.34E-08	5.61E-06		776	2.47E-07	4.29E-07	2.47E-07	2.74E-07
576	4.80E-06	6.76E-05	3.31E-08	1.21E-05		780	2.77E-07	4.81E-07	2.77E-07	3.06E-07
580	1.08E-05	1.26E-04	7.50E-07	2.31E-05						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	calender		flower yellow				calender		flower yellow	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	2.70E-06	1.33E-07	1.69E-07		584	2.18E-05	2.53E-04	7.40E-06	9.24E-05
384	1.09E-07	4.44E-06	1.09E-07	1.39E-07		588	2.20E-05	2.53E-04	7.67E-06	9.31E-05
388	9.16E-08	2.77E-06	9.16E-08	1.17E-07		592	1.62E-05	1.88E-04	5.28E-06	6.98E-05
392	7.96E-08	3.53E-07	7.96E-08	1.01E-07		596	1.03E-05	1.26E-04	3.11E-06	4.71E-05
396	7.47E-08	2.19E-06	7.47E-08	2.50E-07		600	6.96E-06	9.21E-05	2.08E-06	3.49E-05
400	2.34E-07	1.40E-05	6.86E-08	1.27E-06		604	9.41E-06	1.24E-04	3.04E-06	4.83E-05
404	6.12E-07	2.22E-05	6.21E-08	2.55E-06		608	4.35E-05	4.88E-04	1.72E-05	1.95E-04
408	3.22E-07	1.74E-05	5.81E-08	1.45E-06		612	6.56E-05	7.27E-04	2.62E-05	2.90E-04
412	5.87E-07	1.58E-05	5.67E-08	7.22E-08		616	4.53E-05	5.09E-04	1.75E-05	2.03E-04
416	1.06E-06	2.25E-05	5.58E-08	7.11E-08		620	2.49E-05	2.87E-04	9.25E-06	1.16E-04
420	1.84E-06	3.48E-05	5.33E-08	1.89E-06		624	1.66E-05	1.96E-04	6.20E-06	7.99E-05
424	4.25E-06	5.56E-05	5.01E-08	4.24E-06		628	1.31E-05	1.65E-04	4.51E-06	6.84E-05
428	9.13E-06	1.07E-04	4.80E-08	9.92E-06		632	9.01E-06	1.24E-04	2.80E-06	5.14E-05
432	2.22E-05	2.59E-04	6.02E-07	2.47E-05		636	3.45E-06	6.36E-05	6.38E-07	2.51E-05
436	2.85E-05	3.27E-04	1.54E-06	3.17E-05		640	8.16E-07	3.26E-05	4.03E-08	1.29E-05
440	1.97E-05	2.25E-04	7.80E-07	2.17E-05		644	9.35E-07	3.26E-05	4.15E-08	1.42E-05
444	1.32E-05	1.53E-04	3.86E-07	1.38E-05		648	1.71E-06	4.51E-05	4.29E-08	2.00E-05
448	1.23E-05	1.37E-04	3.99E-07	1.31E-05		652	1.72E-06	4.68E-05	4.45E-08	2.01E-05
452	1.22E-05	1.36E-04	1.38E-07	1.49E-05		656	4.15E-07	3.53E-05	4.62E-08	1.46E-05
456	1.16E-05	1.33E-04	4.04E-08	1.52E-05		660	1.88E-07	3.26E-05	4.79E-08	1.38E-05
460	1.09E-05	1.28E-04	1.55E-07	1.53E-05		664	2.27E-07	3.46E-05	4.96E-08	1.44E-05
464	1.01E-05	1.22E-04	5.94E-07	1.56E-05		668	5.11E-08	3.07E-05	5.11E-08	1.31E-05
468	9.63E-06	1.17E-04	6.65E-07	1.59E-05		672	5.25E-08	2.68E-05	5.25E-08	1.09E-05
472	9.28E-06	1.13E-04	7.46E-07	1.60E-05		676	5.40E-08	2.45E-05	5.40E-08	1.01E-05
476	9.58E-06	1.15E-04	7.35E-07	1.73E-05		680	5.56E-08	2.61E-05	5.56E-08	1.05E-05
480	1.26E-05	1.48E-04	1.27E-06	2.58E-05		684	5.73E-08	2.78E-05	5.73E-08	1.15E-05
484	2.00E-05	2.26E-04	2.87E-06	4.23E-05		688	5.92E-08	2.95E-05	5.92E-08	1.24E-05
488	2.51E-05	2.76E-04	4.13E-06	5.40E-05		692	6.12E-08	2.63E-05	6.12E-08	1.05E-05
492	2.31E-05	2.55E-04	3.89E-06	5.14E-05		696	6.40E-08	1.55E-05	6.40E-08	6.15E-06
496	1.76E-05	1.97E-04	2.87E-06	4.09E-05		700	6.74E-08	1.82E-05	6.74E-08	7.01E-06
500	1.10E-05	1.31E-04	1.29E-06	2.86E-05		704	5.87E-07	4.83E-05	7.09E-08	2.36E-05
504	7.73E-06	9.32E-05	4.28E-07	2.08E-05		708	2.84E-06	8.48E-05	7.50E-08	4.33E-05
508	5.77E-06	7.62E-05	3.24E-07	1.83E-05		712	1.42E-06	7.37E-05	8.05E-08	3.70E-05
512	5.07E-06	6.94E-05	8.94E-08	1.68E-05		716	8.59E-08	3.30E-05	8.59E-08	1.46E-05
516	4.50E-06	6.30E-05	1.08E-07	1.59E-05		720	9.16E-08	9.08E-06	9.16E-08	2.37E-06
520	4.34E-06	5.70E-05	1.02E-07	1.51E-05		724	9.77E-08	4.61E-06	9.77E-08	1.24E-07
524	3.46E-06	5.17E-05	3.39E-08	1.41E-05		728	1.04E-07	3.09E-06	1.04E-07	1.33E-07
528	3.16E-06	5.13E-05	3.43E-08	1.40E-05		732	1.10E-07	3.20E-07	1.10E-07	1.41E-07
532	4.61E-06	6.57E-05	4.69E-07	1.87E-05		736	1.17E-07	9.95E-07	1.17E-07	1.49E-07
536	1.59E-05	1.84E-04	4.00E-06	5.58E-05		740	1.23E-07	3.51E-06	1.23E-07	1.57E-07
540	5.32E-05	5.76E-04	1.62E-05	1.78E-04		744	1.30E-07	2.57E-06	1.30E-07	1.66E-07
544	8.10E-05	8.71E-04	2.55E-05	2.71E-04		748	1.38E-07	2.54E-06	1.38E-07	1.75E-07
548	5.51E-05	5.95E-04	1.66E-05	1.86E-04		752	1.46E-07	3.31E-06	1.46E-07	1.86E-07
552	2.51E-05	2.78E-04	7.09E-06	8.82E-05		756	1.57E-07	2.26E-06	1.57E-07	2.01E-07
556	9.51E-06	1.12E-04	2.18E-06	3.57E-05		760	1.71E-07	3.00E-06	1.71E-07	2.17E-07
560	3.28E-06	4.79E-05	3.03E-07	1.54E-05		764	1.85E-07	2.65E-06	1.85E-07	2.35E-07
564	1.23E-06	2.94E-05	3.31E-08	9.96E-06		768	2.01E-07	5.82E-07	2.01E-07	2.56E-07
568	6.18E-07	2.66E-05	3.34E-08	8.57E-06		772	2.24E-07	6.48E-07	2.24E-07	2.85E-07
572	2.24E-06	4.13E-05	4.60E-08	1.39E-05		776	2.47E-07	7.16E-07	2.47E-07	3.15E-07
576	7.00E-06	9.42E-05	1.45E-06	3.37E-05		780	2.77E-07	8.02E-07	2.77E-07	3.53E-07
580	1.45E-05	1.79E-04	4.68E-06	6.49E-05						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	basket		flower violet				basket		flower violet	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	1.33E-07		584	2.55E-06	4.16E-05	2.03E-06	3.76E-05
384	1.09E-07	1.09E-07	1.09E-07	1.09E-07		588	2.39E-06	4.23E-05	2.19E-06	3.77E-05
388	9.16E-08	9.16E-08	9.16E-08	9.16E-08		592	1.71E-06	3.21E-05	8.61E-07	2.81E-05
392	7.96E-08	7.96E-08	7.96E-08	7.96E-08		596	4.90E-07	2.15E-05	2.07E-07	1.88E-05
396	7.47E-08	7.47E-08	7.47E-08	6.55E-07		600	3.48E-08	1.57E-05	3.48E-08	1.39E-05
400	6.86E-08	6.86E-08	1.10E-07	4.47E-06		604	7.25E-07	2.24E-05	7.23E-07	2.20E-05
404	6.21E-08	6.21E-08	1.34E-07	6.74E-06		608	7.35E-06	9.40E-05	8.08E-06	9.94E-05
408	5.81E-08	5.81E-08	5.81E-08	4.41E-06		612	1.19E-05	1.41E-04	1.33E-05	1.52E-04
412	5.67E-08	5.67E-08	5.67E-08	3.08E-06		616	7.86E-06	9.97E-05	9.06E-06	1.10E-04
416	5.58E-08	5.58E-08	5.58E-08	4.61E-06		620	3.25E-06	5.70E-05	4.92E-06	6.77E-05
420	5.33E-08	2.36E-07	5.33E-08	7.40E-06		624	1.36E-06	3.95E-05	3.49E-06	5.19E-05
424	5.01E-08	1.24E-06	1.94E-07	1.19E-05		628	7.70E-07	3.37E-05	2.70E-06	4.84E-05
428	4.80E-08	4.22E-06	1.79E-06	2.54E-05		632	4.01E-07	2.48E-05	1.36E-06	3.83E-05
432	2.65E-07	1.23E-05	5.65E-06	6.38E-05		636	3.94E-08	1.18E-05	2.00E-07	1.99E-05
436	3.99E-07	1.60E-05	7.15E-06	8.12E-05		640	4.03E-08	5.46E-06	4.03E-08	1.16E-05
440	1.17E-07	1.12E-05	4.64E-06	5.54E-05		644	4.15E-08	5.97E-06	4.15E-08	1.40E-05
444	4.38E-08	7.32E-06	2.26E-06	3.75E-05		648	4.29E-08	8.55E-06	5.81E-08	2.04E-05
448	4.20E-08	7.12E-06	1.90E-06	3.49E-05		652	4.45E-08	9.38E-06	6.50E-08	2.18E-05
452	4.09E-08	7.54E-06	2.11E-06	3.40E-05		656	4.62E-08	6.53E-06	4.62E-08	1.73E-05
456	4.04E-08	7.27E-06	2.34E-06	3.37E-05		660	4.79E-08	5.96E-06	4.79E-08	1.68E-05
460	4.02E-08	7.09E-06	2.26E-06	3.31E-05		664	4.96E-08	6.32E-06	4.96E-08	1.87E-05
464	3.98E-08	7.36E-06	2.22E-06	3.19E-05		668	5.11E-08	5.39E-06	5.11E-08	1.76E-05
468	3.91E-08	7.68E-06	1.91E-06	3.07E-05		672	5.25E-08	4.17E-06	5.25E-08	1.55E-05
472	3.82E-08	7.72E-06	1.73E-06	2.99E-05		676	5.40E-08	3.62E-06	5.40E-08	1.49E-05
476	3.71E-08	8.29E-06	2.03E-06	3.00E-05		680	5.56E-08	3.79E-06	5.56E-08	1.49E-05
480	5.83E-08	1.17E-05	3.14E-06	3.95E-05		684	5.73E-08	3.45E-06	5.73E-08	1.73E-05
484	2.34E-07	1.89E-05	5.05E-06	6.07E-05		688	5.92E-08	3.96E-06	5.92E-08	1.83E-05
488	7.67E-07	2.44E-05	6.69E-06	7.37E-05		692	6.12E-08	3.51E-06	6.12E-08	1.53E-05
492	8.58E-07	2.26E-05	5.91E-06	6.64E-05		696	6.40E-08	1.03E-06	6.40E-08	9.54E-06
496	2.92E-07	1.75E-05	3.70E-06	4.97E-05		700	6.74E-08	1.31E-06	6.74E-08	1.19E-05
500	1.25E-07	1.17E-05	1.94E-06	3.16E-05		704	7.09E-08	9.24E-06	7.09E-08	3.38E-05
504	3.48E-08	8.41E-06	9.80E-07	2.12E-05		708	7.50E-08	1.91E-05	5.56E-07	5.97E-05
508	3.43E-08	6.96E-06	6.36E-07	1.64E-05		712	8.05E-08	1.50E-05	2.72E-07	5.17E-05
512	3.38E-08	6.43E-06	3.90E-07	1.43E-05		716	8.59E-08	4.24E-06	8.59E-08	2.23E-05
516	3.37E-08	6.28E-06	1.61E-07	1.24E-05		720	9.16E-08	9.16E-08	9.16E-08	4.17E-06
520	3.36E-08	5.66E-06	4.52E-08	1.05E-05		724	9.77E-08	9.77E-08	9.77E-08	1.69E-07
524	3.39E-08	4.64E-06	3.39E-08	9.27E-06		728	1.04E-07	1.04E-07	1.04E-07	1.04E-07
528	3.43E-08	4.83E-06	3.43E-08	8.41E-06		732	1.10E-07	1.10E-07	1.10E-07	1.10E-07
532	3.43E-08	6.91E-06	8.44E-08	1.06E-05		736	1.17E-07	1.17E-07	1.17E-07	1.17E-07
536	1.01E-06	2.27E-05	1.90E-06	3.13E-05		740	1.23E-07	1.23E-07	1.23E-07	1.23E-07
540	6.00E-06	7.45E-05	8.75E-06	1.00E-04		744	1.30E-07	1.30E-07	1.30E-07	1.30E-07
544	1.00E-05	1.14E-04	1.40E-05	1.51E-04		748	1.38E-07	1.38E-07	1.38E-07	1.38E-07
548	6.52E-06	7.90E-05	9.09E-06	1.01E-04		752	1.46E-07	1.46E-07	1.46E-07	1.46E-07
552	2.23E-06	3.71E-05	3.41E-06	4.61E-05		756	1.57E-07	1.57E-07	1.57E-07	1.57E-07
556	2.92E-07	1.47E-05	6.61E-07	1.75E-05		760	1.71E-07	1.71E-07	1.71E-07	1.71E-07
560	3.27E-08	5.58E-06	3.27E-08	6.73E-06		764	1.85E-07	1.85E-07	1.85E-07	1.85E-07
564	3.31E-08	2.87E-06	3.31E-08	3.89E-06		768	2.01E-07	2.01E-07	2.01E-07	2.01E-07
568	3.34E-08	2.63E-06	3.34E-08	2.91E-06		772	2.24E-07	2.24E-07	2.24E-07	2.24E-07
572	3.34E-08	5.25E-06	3.34E-08	5.47E-06		776	2.47E-07	2.47E-07	2.47E-07	2.47E-07
576	5.11E-08	1.42E-05	1.23E-07	1.37E-05		780	2.77E-07	2.77E-07	2.77E-07	2.77E-07
580	1.25E-06	2.84E-05	9.84E-07	2.61E-05						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	rabbit		Ribbin				rabbit		Ribbin	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.11E-06	1.33E-07	1.33E-07		584	9.85E-06	1.13E-04	7.80E-07	2.74E-05
384	1.09E-07	4.50E-07	1.09E-07	1.09E-07		588	9.89E-06	1.14E-04	9.84E-07	2.74E-05
388	9.16E-08	1.72E-07	9.16E-08	9.16E-08		592	6.69E-06	8.48E-05	3.06E-07	2.00E-05
392	7.96E-08	6.44E-07	7.96E-08	7.96E-08		596	3.76E-06	5.68E-05	3.40E-08	1.26E-05
396	7.47E-08	2.07E-06	7.47E-08	7.47E-08		600	2.12E-06	4.10E-05	3.48E-08	8.42E-06
400	6.86E-08	8.29E-06	6.86E-08	9.58E-07		604	3.72E-06	5.46E-05	1.55E-07	1.18E-05
404	6.21E-08	1.28E-05	6.21E-08	2.05E-06		608	2.06E-05	2.21E-04	3.38E-06	5.30E-05
408	5.81E-08	8.91E-06	5.81E-08	9.82E-07		612	3.17E-05	3.29E-04	5.73E-06	7.87E-05
412	5.67E-08	6.12E-06	5.67E-08	7.55E-07		616	2.14E-05	2.30E-04	3.14E-06	5.39E-05
416	5.58E-08	8.19E-06	5.58E-08	1.33E-06		620	1.10E-05	1.30E-04	8.26E-07	2.93E-05
420	3.00E-07	1.26E-05	5.33E-08	2.97E-06		624	6.77E-06	8.85E-05	7.18E-08	1.91E-05
424	5.12E-07	2.01E-05	5.01E-08	5.61E-06		628	5.46E-06	7.45E-05	3.82E-08	1.58E-05
428	2.65E-06	4.04E-05	3.32E-07	1.06E-05		632	3.41E-06	5.57E-05	3.88E-08	1.12E-05
432	8.65E-06	9.87E-05	1.66E-06	2.66E-05		636	6.67E-07	2.77E-05	3.94E-08	4.82E-06
436	1.13E-05	1.25E-04	2.15E-06	3.37E-05		640	4.03E-08	1.43E-05	4.03E-08	1.42E-06
440	7.54E-06	8.55E-05	6.38E-07	2.28E-05		644	4.15E-08	1.49E-05	4.15E-08	1.27E-06
444	4.68E-06	5.83E-05	1.23E-07	1.52E-05		648	4.29E-08	2.01E-05	4.29E-08	2.61E-06
448	4.42E-06	5.37E-05	5.30E-08	1.37E-05		652	4.45E-08	2.03E-05	4.45E-08	2.62E-06
452	4.24E-06	5.28E-05	1.06E-07	1.40E-05		656	4.62E-08	1.50E-05	4.62E-08	1.91E-06
456	4.36E-06	5.13E-05	4.04E-08	1.32E-05		660	4.79E-08	1.33E-05	4.79E-08	1.55E-06
460	4.11E-06	4.96E-05	4.02E-08	1.26E-05		664	4.96E-08	1.48E-05	4.96E-08	1.44E-06
464	3.76E-06	4.80E-05	3.98E-08	1.22E-05		668	5.11E-08	1.28E-05	5.11E-08	1.36E-06
468	3.38E-06	4.71E-05	3.91E-08	1.19E-05		672	5.25E-08	1.00E-05	5.25E-08	4.95E-07
472	3.52E-06	4.56E-05	3.82E-08	1.16E-05		676	5.40E-08	9.64E-06	5.40E-08	8.06E-08
476	3.49E-06	4.59E-05	3.71E-08	1.29E-05		680	5.56E-08	9.93E-06	5.56E-08	4.62E-07
480	4.79E-06	6.05E-05	3.31E-07	1.92E-05		684	5.73E-08	1.05E-05	5.73E-08	6.63E-07
484	8.25E-06	9.40E-05	1.77E-06	3.21E-05		688	5.92E-08	1.11E-05	5.92E-08	1.12E-06
488	1.07E-05	1.16E-04	3.18E-06	4.16E-05		692	6.12E-08	8.61E-06	6.12E-08	9.02E-07
492	9.57E-06	1.07E-04	2.71E-06	3.98E-05		696	6.40E-08	4.53E-06	6.40E-08	6.40E-08
496	7.01E-06	8.21E-05	1.99E-06	3.17E-05		700	6.74E-08	5.50E-06	6.74E-08	3.70E-07
500	4.16E-06	5.57E-05	9.82E-07	2.16E-05		704	7.09E-08	2.12E-05	7.09E-08	5.58E-06
504	2.36E-06	3.92E-05	1.08E-07	1.49E-05		708	7.50E-08	3.84E-05	7.50E-08	1.20E-05
508	1.81E-06	3.20E-05	3.43E-08	1.22E-05		712	8.05E-08	3.18E-05	8.05E-08	9.14E-06
512	1.49E-06	2.89E-05	3.38E-08	1.05E-05		716	8.59E-08	1.26E-05	8.59E-08	1.86E-06
516	1.16E-06	2.64E-05	3.37E-08	9.53E-06		720	9.16E-08	1.89E-06	9.16E-08	9.16E-08
520	1.00E-06	2.37E-05	3.36E-08	8.35E-06		724	9.77E-08	1.56E-07	9.77E-08	9.77E-08
524	6.26E-07	2.11E-05	3.39E-08	6.75E-06		728	1.04E-07	1.66E-07	1.04E-07	1.04E-07
528	4.33E-07	2.08E-05	3.43E-08	6.41E-06		732	1.10E-07	1.76E-07	1.10E-07	1.10E-07
532	9.58E-07	2.80E-05	3.43E-08	8.27E-06		736	1.17E-07	1.87E-07	1.17E-07	1.17E-07
536	6.73E-06	8.08E-05	1.19E-06	2.56E-05		740	1.23E-07	1.96E-07	1.23E-07	1.23E-07
540	2.49E-05	2.55E-04	6.79E-06	8.23E-05		744	1.30E-07	2.08E-07	1.30E-07	1.30E-07
544	3.83E-05	3.85E-04	1.13E-05	1.23E-04		748	1.38E-07	2.20E-07	1.38E-07	1.38E-07
548	2.54E-05	2.61E-04	7.06E-06	8.17E-05		752	1.46E-07	2.33E-07	1.46E-07	1.46E-07
552	1.13E-05	1.22E-04	2.52E-06	3.65E-05		756	1.57E-07	2.51E-07	1.57E-07	1.57E-07
556	3.80E-06	4.94E-05	4.43E-07	1.34E-05		760	1.71E-07	2.72E-07	1.71E-07	1.71E-07
560	6.34E-07	2.12E-05	3.27E-08	4.57E-06		764	1.85E-07	2.95E-07	1.85E-07	1.85E-07
564	4.73E-08	1.27E-05	3.31E-08	2.05E-06		768	2.01E-07	3.20E-07	2.01E-07	2.01E-07
568	3.34E-08	1.15E-05	3.34E-08	1.41E-06		772	2.24E-07	3.57E-07	2.24E-07	2.24E-07
572	3.10E-07	1.81E-05	3.34E-08	2.95E-06		776	2.47E-07	3.94E-07	2.47E-07	2.47E-07
576	2.39E-06	4.22E-05	3.31E-08	9.16E-06		780	2.77E-07	4.42E-07	2.77E-07	2.77E-07
580	6.31E-06	8.01E-05	1.72E-07	1.87E-05						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	cloch		whitePaper				cloch		whitePaper	
	5lx	50lx	5lx	50lx			5lx	50lx	5lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2	w/sr*m2
380	1.33E-07	1.33E-07	1.33E-07	7.73E-07		584	3.28E-08	1.11E-05	1.26E-05	1.49E-04
384	1.09E-07	1.09E-07	1.09E-07	2.07E-07		588	3.28E-08	1.14E-05	1.26E-05	1.49E-04
388	9.16E-08	9.16E-08	9.16E-08	1.74E-07		592	3.33E-08	8.41E-06	9.10E-06	1.11E-04
392	7.96E-08	7.96E-08	7.96E-08	1.51E-07		596	3.40E-08	4.82E-06	4.88E-06	7.50E-05
396	7.47E-08	1.29E-07	7.47E-08	9.62E-07		600	3.48E-08	2.93E-06	3.05E-06	5.44E-05
400	6.86E-08	9.84E-07	6.86E-08	6.62E-06		604	3.57E-08	4.65E-06	5.23E-06	7.31E-05
404	6.21E-08	2.42E-06	6.21E-08	1.10E-05		608	4.47E-07	2.54E-05	2.63E-05	2.90E-04
408	5.81E-08	1.80E-06	5.81E-08	9.06E-06		612	1.74E-06	3.88E-05	3.92E-05	4.32E-04
412	5.67E-08	1.19E-06	5.67E-08	7.97E-06		616	6.66E-07	2.59E-05	2.69E-05	3.03E-04
416	5.58E-08	1.84E-06	5.58E-08	1.06E-05		620	3.75E-08	1.43E-05	1.45E-05	1.71E-04
420	5.33E-08	3.20E-06	2.95E-07	1.66E-05		624	3.78E-08	9.32E-06	8.84E-06	1.17E-04
424	5.01E-08	6.18E-06	5.55E-07	2.76E-05		628	3.82E-08	8.06E-06	7.22E-06	9.82E-05
428	3.89E-07	1.44E-05	3.81E-06	5.63E-05		632	3.88E-08	5.59E-06	4.52E-06	7.40E-05
432	2.20E-06	3.65E-05	1.12E-05	1.36E-04		636	3.94E-08	1.53E-06	1.07E-06	3.68E-05
436	3.29E-06	4.60E-05	1.41E-05	1.74E-04		640	4.03E-08	9.39E-08	4.79E-08	1.99E-05
440	1.89E-06	3.01E-05	9.89E-06	1.20E-04		644	4.15E-08	1.06E-07	5.58E-08	2.01E-05
444	3.18E-07	2.00E-05	6.76E-06	8.26E-05		648	4.29E-08	6.58E-07	9.81E-08	2.63E-05
448	6.22E-07	1.90E-05	5.62E-06	7.53E-05		652	4.45E-08	8.96E-07	4.45E-08	2.72E-05
452	1.19E-06	1.84E-05	6.01E-06	7.46E-05		656	4.62E-08	2.37E-07	4.62E-08	2.01E-05
456	4.18E-07	1.81E-05	5.84E-06	7.35E-05		660	4.79E-08	4.79E-08	4.79E-08	1.84E-05
460	2.51E-07	1.69E-05	5.33E-06	7.10E-05		664	4.96E-08	4.96E-08	4.96E-08	2.01E-05
464	3.80E-07	1.55E-05	5.01E-06	6.80E-05		668	5.11E-08	5.11E-08	5.11E-08	1.84E-05
468	2.94E-07	1.48E-05	4.99E-06	6.51E-05		672	5.25E-08	5.25E-08	5.25E-08	1.53E-05
472	6.48E-08	1.40E-05	4.59E-06	6.32E-05		676	5.40E-08	5.40E-08	5.40E-08	1.45E-05
476	3.86E-07	1.38E-05	4.70E-06	6.34E-05		680	5.56E-08	5.56E-08	5.56E-08	1.48E-05
480	3.89E-07	1.77E-05	6.69E-06	8.42E-05		684	5.73E-08	5.73E-08	5.73E-08	1.44E-05
484	1.49E-06	2.73E-05	1.12E-05	1.29E-04		688	5.92E-08	5.92E-08	5.92E-08	1.50E-05
488	1.87E-06	3.31E-05	1.40E-05	1.58E-04		692	6.12E-08	6.12E-08	6.12E-08	1.26E-05
492	1.46E-06	2.92E-05	1.28E-05	1.45E-04		696	6.40E-08	6.40E-08	6.40E-08	7.27E-06
496	9.77E-07	2.11E-05	9.29E-06	1.12E-04		700	6.74E-08	6.74E-08	6.74E-08	1.03E-05
500	1.25E-07	1.29E-05	5.63E-06	7.46E-05		704	7.09E-08	7.09E-08	7.09E-08	2.75E-05
504	5.54E-08	8.36E-06	3.90E-06	5.28E-05		708	7.50E-08	1.52E-06	6.15E-07	4.90E-05
508	7.24E-08	6.54E-06	2.67E-06	4.36E-05		712	8.05E-08	9.08E-07	8.05E-08	4.15E-05
512	3.38E-08	5.38E-06	2.08E-06	3.93E-05		716	8.59E-08	8.59E-08	8.59E-08	1.81E-05
516	3.37E-08	4.31E-06	1.79E-06	3.55E-05		720	9.16E-08	9.16E-08	9.16E-08	2.66E-06
520	3.36E-08	3.53E-06	1.29E-06	3.23E-05		724	9.77E-08	9.77E-08	9.77E-08	1.86E-07
524	3.39E-08	3.13E-06	8.77E-07	2.81E-05		728	1.04E-07	1.04E-07	1.04E-07	1.98E-07
528	3.43E-08	2.55E-06	4.57E-07	2.78E-05		732	1.10E-07	1.10E-07	1.10E-07	2.10E-07
532	3.43E-08	3.31E-06	1.42E-06	3.68E-05		736	1.17E-07	1.17E-07	1.17E-07	2.22E-07
536	7.74E-08	1.16E-05	8.42E-06	1.05E-04		740	1.23E-07	1.23E-07	1.23E-07	2.34E-07
540	2.08E-06	3.90E-05	3.09E-05	3.33E-04		744	1.30E-07	1.30E-07	1.30E-07	2.48E-07
544	4.29E-06	5.78E-05	4.75E-05	5.03E-04		748	1.38E-07	1.38E-07	1.38E-07	2.62E-07
548	2.43E-06	3.63E-05	3.20E-05	3.43E-04		752	1.46E-07	1.46E-07	1.46E-07	2.78E-07
552	4.61E-07	1.52E-05	1.40E-05	1.61E-04		756	1.57E-07	1.57E-07	1.57E-07	2.99E-07
556	3.22E-08	4.99E-06	4.63E-06	6.48E-05		760	1.71E-07	1.71E-07	1.71E-07	3.24E-07
560	3.27E-08	6.68E-07	1.01E-06	2.72E-05		764	1.85E-07	1.85E-07	1.85E-07	3.51E-07
564	3.31E-08	3.31E-08	8.63E-08	1.70E-05		768	2.01E-07	2.01E-07	2.01E-07	3.82E-07
568	3.34E-08	3.34E-08	3.34E-08	1.43E-05		772	2.24E-07	2.24E-07	2.24E-07	4.25E-07
572	3.34E-08	4.99E-07	4.49E-07	2.31E-05		776	2.47E-07	2.47E-07	2.47E-07	4.70E-07
576	3.31E-08	2.87E-06	3.17E-06	5.47E-05		780	2.77E-07	2.77E-07	2.77E-07	5.26E-07
580	3.28E-08	6.98E-06	8.12E-06	1.04E-04						

Table F-42 The spectral distribution data of the subjects in the observer's room for 5lux and 50lux.

	flower		leave Green			flower		leave Green
	5lx	50lx	50lx			5lx	50lx	50lx
(nm)	w/sr*m2	w/sr*m2	w/sr*m2		(nm)	w/sr*m2	w/sr*m2	w/sr*m2
380	5.71E-07	6.24E-07	1.33E-07		584	1.06E-05	1.16E-04	7.25E-06
384	1.09E-07	1.67E-07	1.09E-07		588	1.10E-05	1.20E-04	6.87E-06
388	9.16E-08	6.04E-07	9.16E-08		592	8.02E-06	9.23E-05	4.43E-06
392	7.96E-08	1.51E-07	7.96E-08		596	5.27E-06	6.44E-05	2.24E-06
396	7.47E-08	6.12E-07	7.47E-08		600	3.76E-06	4.89E-05	1.19E-06
400	6.86E-08	4.57E-06	6.86E-08		604	6.10E-06	7.10E-05	1.62E-06
404	6.21E-08	7.72E-06	6.21E-08		608	2.89E-05	2.98E-04	9.44E-06
408	5.81E-08	4.90E-06	5.81E-08		612	4.37E-05	4.44E-04	1.49E-05
412	5.67E-08	4.15E-06	5.67E-08		616	3.05E-05	3.13E-04	9.55E-06
416	5.58E-08	4.39E-06	5.58E-08		620	1.75E-05	1.82E-04	4.07E-06
420	8.03E-08	7.27E-06	5.33E-08		624	1.16E-05	1.29E-04	2.03E-06
424	6.69E-07	1.17E-05	5.01E-08		628	9.62E-06	1.12E-04	1.75E-06
428	1.54E-06	2.28E-05	3.89E-07		632	6.73E-06	8.49E-05	6.99E-07
432	4.83E-06	5.57E-05	1.98E-06		636	2.37E-06	4.35E-05	3.94E-08
436	6.04E-06	7.05E-05	2.91E-06		640	3.39E-07	2.31E-05	4.03E-08
440	3.81E-06	4.77E-05	1.56E-06		644	7.86E-07	2.37E-05	4.15E-08
444	2.33E-06	3.18E-05	3.59E-07		648	1.47E-06	3.30E-05	4.29E-08
448	2.21E-06	2.88E-05	2.86E-07		652	1.57E-06	3.40E-05	4.45E-08
452	2.08E-06	2.91E-05	3.13E-07		656	4.57E-07	2.58E-05	4.62E-08
456	2.41E-06	2.86E-05	5.24E-07		660	3.11E-07	2.33E-05	4.79E-08
460	2.40E-06	2.78E-05	3.47E-07		664	7.09E-07	2.49E-05	4.96E-08
464	2.28E-06	2.66E-05	4.57E-07		668	5.25E-07	2.26E-05	5.11E-08
468	1.89E-06	2.69E-05	1.78E-07		672	1.23E-07	1.97E-05	5.25E-08
472	2.19E-06	2.73E-05	5.09E-07		676	5.40E-08	1.72E-05	5.40E-08
476	2.15E-06	2.78E-05	4.87E-07		680	5.56E-08	1.75E-05	5.56E-08
480	2.94E-06	3.84E-05	1.19E-06		684	1.06E-07	1.86E-05	5.73E-08
484	5.59E-06	6.24E-05	3.05E-06		688	1.04E-07	2.04E-05	5.92E-08
488	7.40E-06	7.91E-05	4.55E-06		692	6.12E-08	1.76E-05	6.12E-08
492	6.85E-06	7.49E-05	4.57E-06		696	6.40E-08	1.07E-05	6.40E-08
496	5.20E-06	5.97E-05	3.55E-06		700	6.74E-08	1.30E-05	6.74E-08
500	3.33E-06	4.14E-05	2.31E-06		704	1.28E-06	3.59E-05	7.09E-08
504	1.92E-06	3.07E-05	1.43E-06		708	2.95E-06	6.45E-05	7.50E-08
508	1.47E-06	2.65E-05	1.26E-06		712	1.86E-06	5.45E-05	8.05E-08
512	1.56E-06	2.46E-05	1.17E-06		716	8.59E-08	2.46E-05	8.59E-08
516	1.34E-06	2.25E-05	1.24E-06		720	9.16E-08	5.59E-06	9.16E-08
520	1.12E-06	2.02E-05	1.32E-06		724	9.77E-08	4.49E-07	9.77E-08
524	1.01E-06	1.84E-05	8.54E-07		728	1.04E-07	1.60E-07	1.04E-07
528	8.45E-07	1.88E-05	8.45E-07		732	1.10E-07	1.69E-07	1.10E-07
532	1.39E-06	2.52E-05	1.39E-06		736	1.17E-07	1.80E-07	1.17E-07
536	6.01E-06	7.13E-05	6.67E-06		740	1.23E-07	1.89E-07	1.23E-07
540	2.17E-05	2.26E-04	2.46E-05		744	1.30E-07	2.00E-07	1.30E-07
544	3.39E-05	3.42E-04	3.84E-05		748	1.38E-07	2.11E-07	1.38E-07
548	2.26E-05	2.31E-04	2.51E-05		752	1.46E-07	2.25E-07	1.46E-07
552	1.00E-05	1.08E-04	1.07E-05		756	1.57E-07	2.42E-07	1.57E-07
556	3.33E-06	4.35E-05	3.75E-06		760	1.71E-07	2.62E-07	1.71E-07
560	1.16E-06	1.91E-05	5.90E-07		764	1.85E-07	2.84E-07	1.85E-07
564	1.29E-07	1.22E-05	3.31E-08		768	2.01E-07	3.08E-07	2.01E-07
568	8.36E-08	1.07E-05	3.34E-08		772	2.24E-07	3.43E-07	2.24E-07
572	6.32E-07	1.74E-05	2.60E-07		776	2.47E-07	3.80E-07	2.47E-07
576	2.86E-06	4.17E-05	1.72E-06		780	2.77E-07	4.25E-07	2.77E-07
580	7.12E-06	8.06E-05	4.78E-06					

APPENDIX G

THE LIELMHOLTZ-KOHLRAUSCH EFFECT

Hchnholtz was the first to notice that the saturation of a colour affected its luminosity, and that some colours appear much brighter at higher saturation even though the luminance was kept constant. The effect was investigated subsequently by Kohlrausch. He showed that if he placed two patches of colour of the same luminance side by side, one of high and the other of low saturation, the former would appear brighter, but that if they were flickered and thus seen alternately, the differential luminosity effect disappeared.

The effect can give rise to odd situations, which can be demonstrated easily. For example saturated red and green patches of light can be projected separately on to a screen, and made of equal luminosity to two further spots of white light. If the red and green are now superimposed, the resulting yellow patch (the mixture of red and green) will appear considerably less bright than the combined white patches. Also as shown by MacAdam, the removal of some of the red component of a mixture of red, green, and blue lights increases the luminosity of the remaining mixture.

These striking experiments are demonstrations of the failure of the law of addivity of luminance (which implies that a higher luminance always results in a higher luminosity), and in certain circumstances has quite serious repercussions for the science of photometry. Normally, however, one is dealing with coloured surfaces of reasonably low saturation, when luminances are additive.

The effect is of importance, however, when dealing with fully saturated lights of high luminance, for example coloured traffic and railway lights, rear lights, and direction indicators on motor vehicles, and electric discharge-tube advertising signs. It is well known that a bulb of lower power can be used in a red motor car rear light than in an amber turn indicator. This is because the effect is more marked in the red than in the yellow.

The Hclmholtz-Kohlrausch effect can be investigated by the method of direct estimation. Results of one such experiment are shown in Fig. 8.3 for a white stimulus, S, for colours (S,) of medium saturation, and for colours (S3) of high saturation. The ordinates are the logarithms of the ratio of the white to the colour luminance for equal luminosity. These ratios are greater than unity (log ratio > 0), which means that the white has to be of higher luminance than the colour to appear of the same brightness. For some subjects these effects are quite large. For example for the blue at high saturation, the log ratio is 1.70 which means that the white has to be 50 times the luminance of the blue stimulus to appear of the same luminosity. The corresponding figure for the red is 31 times. The effect is much less in the yellow, however, but it can still be appreciable and a white has to be four times the luminance of the yellow to appear equal in luminosity for this subject.

The explanation of the effect is probably to be found in the neural organisation of the retina. The luminance information is transmitted to the brain along the non-opponent channels, whereas the colour information is sent as colour difference opponent signals. It seems probable that when saturated colours are observed, the colour difference signals are very strong, and that the perception of luminosity is

evolved in the brain from information received not only from the non-opponent channels but also from the colour difference mechanisms.

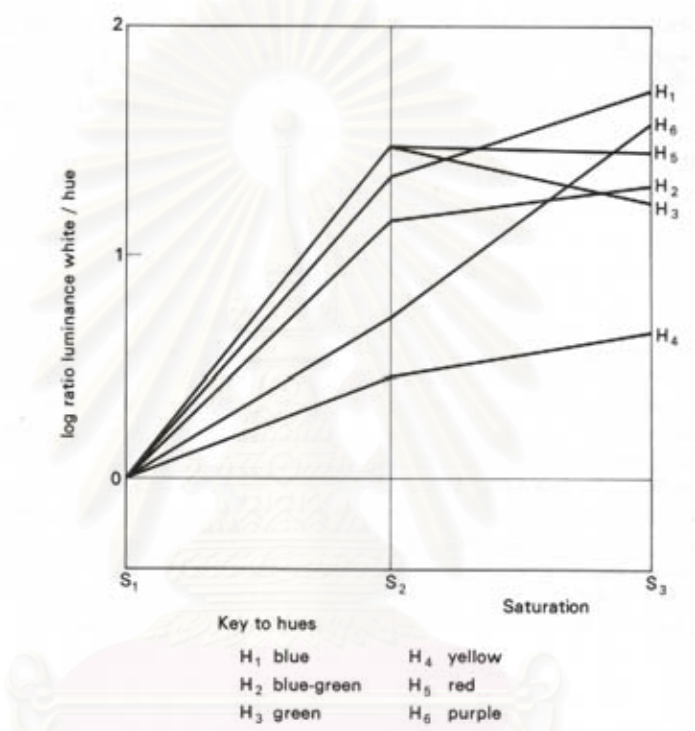


Fig.A-1 The Helmholtz- Kohlrausch effect.

(Padgham, C. A. and Saunders, J. E. *The perception of light and colour; G.* Bell & Sons Ltd: London; pp 135-137)

VIVA

Miss Yuwadee Thiangthangtum was born on June 9, 1976 in Singburi, Thailand. She received her B.Sc. degree in Science from the Faculty of Science, Chulalongkorn University in 1998, and she has been a graduate student in the Imaging Technology Program, Graduate school, Chulalongkorn University since 1999.