

THE SOLAR ATMOSPHERE AROUND ACTIVE REGIONS

46



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## FOREWORD

An active region on the sun is an area of enhanced magnetic field in which many solar phenomena occur. It is well known that there is a close relation between the terrestrial magnetism and the solar magnetic field. Many theories have been proposed to explain how these sources of magnetic fields evolve on the sun and then disperse outwards into the solar system.

There are several ways by which an astronomer can study solar magnetic fields. Sunspots, a manifestation of solar activity, can be observed directly from which the course of solar magnetism through the photosphere, chromosphere and corona to the neighbourhood of the earth may be studied.

In this thesis only the photospheric and chromospheric structures around sunspots were studied. The development of sunspot groups was studied with the discussion in the light of Babcock's theory. The motion of the plasma was studied in the chromospheric structures taken in the H-alpha line.

## ABSTRACT



Solar observation has been made at the Observatory of the Bangkok Planetarium, and sunspot data taken with the 150 mm-Zeiss-Coude' refractor at the observatory are reduced. The Wolf's sunspot number and types of sunspot groups are found. The coordinates of sunspots are calculated and also approximately deduced by the use of solar grids prepared by the Fraunhofer Institute.

The development of two nearby sunspot groups from 20 November to 1 December 1967 are studied in the light of Babcock's theory on the formation of sunspot groups. Both groups seemed to be produced by a single flux rope of the same turn. Analysis of the data, however, indicates that they did not occur from the same flux rope of the same turn.

Dark features on H-alpha filtergrams around an isolated spot on 16 August, 1967 are studied. Most of them show horizontal motions of material toward the spot while some of them show loop structures. The long threads which are the darkest features in the filtergrams show downward motion to the solar surface. They are interpreted as prominences. A model of magnetic field configuration around the spot in the chromosphere is presented.

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## TABLE OF CONTENTS

	page	
Foreword	III	
Abstract		IV
Acknowledgements		V
1. INTRODUCTION .....		4
References .....		4
2. INSTRUMENTATIONS .....		5
3. REDUCTION OF SUNSPOT DATA .....		8
3.1 Introduction .....		8
3.2 Wolf's sunspot number .....		9
3.3 Classification of sunspot groups .....		11
3.4 Classification of image quality .....		11
3.5 Determination of coordinates of sunspot groups .....		11
3.6 Results .....		18
References .....		18
Appendix I .....		19
4. A STUDY OF THE COMPLEX SUNSPOT GROUPS OF 20 NOVEMBER -		
1 DECEMBER, 1967 .....		30
4.1 Introduction .....		30
4.2 General characteristics of a sunspot group .....		32
4.3 Observation and reduction .....		34
4.4 Description of the complex sunspot groups of		
20 November - 1 December, 1967. ....		35
4.5 Discussion and conclusion .....		45
References .....		48
Appendix II .....		49

5. THE STRUCTURES OF THE CHROMOSPHERE AROUND AN ISOLATED SPOT	page	51
5.1 Introduction .....		51
5.2 Data .....		52
5.3 Reduction .....		53
5.4 Results .....		64
5.5 Discussion .....		64
References .....		65
6. DISCUSSION AND CONCLUSION .....		66
References .....		68

## LIST OF ILLUSTRATIONS

		PAGE
FIGURES	2.1. The 150 mm-Zeiss-Coude' refractor showing..... position of camera attachment for photo- graphic observation	6
	3.1. Zürich classification of sunspot group	10
	3.2. Solar disk taken at Sukhumwit Observatory..... on 6 February 1968. (03h 02 min U.T.)	15
	3.3. Solar disk taken on 6 February 1968. .... (02h 56 min U.T.)	17
PLATES	4.1. The apparent transit of sunspot group across ... the solar disk caused by the rotation of the sun	31
	4.2. The development of pores between two sunspot ... group	37
	4.3. The development of the W-sunspot group ....	39
	4.4. The declining phase of the W-sunspot group.....	40
	4.5. A bright streak in the penumbra of the main..... following spot of the W-sunspot group shown on 28 November 1967.	42
	4.6. The development of the E-sunspot group ....	43



FIGURES	4.1.	The response curve of Duplo Pan Rapid ..... emulsion and transmission curves of filters (a) OG2 and (b) RG5.	36
	4.2.	The formation of a BMR according to Babcock... (1961).	44
PLATES	5.1.	H-alpha filtergram of an isolated sunspot .... near the limb, taken 16 August 1967 at $0.0^{\circ}$ obtained with a $0.5 \text{ \AA}$ bandwidth Halle filter	54
	5.2.	H-alpha filtergrams taken on 16 August 1967, .. with a $0.5 \text{ \AA}$ bandwidth Halle filter showing the differences between the chromospheric structures around the spot in the red and the violet wings.	55
	5.3.	Vortex structures in the chromosphere near a ... sunspot of 16 August 1967, at different positions of the H-alpha line profile	56
	5.4.	Superimposing maps of selected pairs of ..... wavelengths of the vortex structure in Plate 5.3.	57
	5.5.	An underexposed of the umbra of the spot, ..... showing the core of the umbra.	57

FIGURES	5.1.	Diagram showing the prominence of .....	59
		recessive velocities.	
	5.2.	(a) Profile of H-alpha showing red shift .....	60
		of fibrils.	
		(b) Downward motion of prominence	
	5.3.	Loop features found in the chromosphere .....	61
		around the spot.	
	5.4.	Three dimensional model of loop features .....	62
		in the vortex structure.	
	5.5.	A model of magnetic lines of force around ....	63
		a sunspot.	

LIST OF TABLE

	PAGE
TABLE 4.1. Heliographic coordinates of sunspots .....	47