THE SOLAR ATMOSPHERE AROUND ACTIVE REGIONS

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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 terrestial 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

LIST OF ILLUSTRATIONS

PAGE

PAGE

LIST OF TABLE