

## Foreword

This volume is the Proceedings of “the Fourth Symposium on Coordinated Observations of the Ionosphere and the Magnetosphere in the Polar Regions” which was held at the National Institute of Polar Research (NIPR) from February 23th through 25th, 1981. The NIPR annual symposia are devoted entirely to discussing significant scientific results of studies on the ionosphere and the magnetosphere in the polar regions and to making comprehensive understandings of substorm phenomena.

The present volume contains 25 selected contributions among 56 individual scientific papers which were presented to the fourth symposium. These 25 papers may be classified into the following three groups: *i.e.* I) Upper atmosphere disturbances in the polar regions obtained by the ground-based and satellite observations, II) Rocket observations at Syowa Station, Antarctica, and III) Middle Atmosphere Project (MAP) in Antarctica. In Part I, in addition to 12 papers dealing with the Antarctic and Arctic observations of ULF-VLF emissions (6 papers), radio and visual auroras (4 papers) and ionospheric disturbances (2 papers), 2 reports concerning theoretical investigations on the polar upper atmosphere phenomena are presented. Five papers in Part II of this volume report significant results obtained aboard sounding rockets at Syowa Station, Antarctica (4 papers) and at Søndre Strømfjord, Greenland (1 paper). The scientific items are profiles of the electron density, precipitating electrons, electric fields and VLF emissions.

In order to prepare for comprehensive observations of the polar middle atmosphere, the Antarctic Middle Atmosphere (AMA) observation program is being conducted as a cooperative international research project in the period from 1982 to 1986. The scientific aim of AMA includes investigations of dynamics, structure, atmospheric composition, particle precipitation, middle atmosphere-lower ionosphere interactions, atmospheric pollution and northern-southern polar atmosphere comparisons. In Part III, the practical future plans of AMA observations are discussed with special emphasis on the remote sensing techniques.

It is hoped that this special issue of Memoirs of National Institute of Polar Research will be helpful to those who are interested in the ionospheric and magnetospheric disturbances in the polar regions and also to those who are concerned with Antarctica.

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