Space Weather Activities at SERC (1)MAGDAS Project

Kiyohumi Yumoto[1]; Yumoto Kiyohumi MAGDAS/CPMN Group[2]
[1] Space Environ. Res. Center, Kyushu Univ.; [2] -

http://www.serc.kyushu-u.ac.jp

One purpose of Solar Terrestrial Physics (STP) research in the twenty-first century is to support human activities in Space from the aspect of basic research. The scientific aim of the STP community is the creation of new physics:
(1) couplings of the complex and composite system and
(2) macro-and-micro-scale couplings in the Solar-Terrestrial system. The intention is to construct new Network of Stations for ground-based observations and for simulations/empirical modeling.

The Space Environment Research Center (SERC), Kyushu University, is currently deploying a new ground-based magnetometer network, in cooperation with about 30 organizations around the world, in order to study the complex Sun-Earth system for Space Weather. SERC conducts MAGDAS (**MAG**netic **D**ata **A**cqusition **S**ystem) observation at 50 stations in the CPMN (**C**ircum-pan **P**acific **M**agnetometer **N**etwork) region, and conducts FM-CW radar observation along the 210 degree magnetic meridian during the IHY/IPY/eGY/ ILWS/CAWSES periods. From these network observations, we will clarify:
(1) Dynamics of plasmaspheric changes during space storms and substorms,
(2) Electromagnetic responses of magnetosphere-ionosphere-thermosphere complex system to various solar wind changes, and
(3) Penetration mechanisms of DP2-ULF range disturbances from the solar wind into the equatorial ionosphere.

In the present paper, at first, we will introduce our real-time data acquisition and analysis system of MAGDAS, which was deployed in 2005 and 2006, and preliminary results from the MAGDAS project. We will also present our FM-CW radar system at L=1.26 to deduce electric field from the ionospheric plasma drift velocity.
This project is actively providing the followings:
(1) Monitoring of the global 3-dimensional current system to know the electromagnetic coupling of high-latitude and Sq current systems,
(2) Monitoring of the plasma mass density to understand space plasma environment change during space storms.
(3) From 24hr monitoring of the ionospheric drift velocity with 10-sec sampling by the FM-CW radar observation, we can understand how the polar electric field penetrates into the equatorial ionosphere.