
Space Weather Studies at Kyushu University

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In order to understanding couplings of the complexity and composite system, i.e. the solar wind-magnetosphere-ionosphere-Earth's surface system, the Space Environment Research Center (SERC), Kyushu University, Fukuoka, Japan will carry out coordinated ground-based network observations for space weather studies, in cooperation with about 30 organizations in the world during the international CAWSES (Climate And Weather of Sun-Earth System) period (2004-2008). Space weather is one of the four subjects of CAWSES program. SERC is now constructing a real-time MAGnetic Data Acquisition System for Circum-pan Pacific Magnetometer Network, i.e. MAGDAS/CPMN system. MAGDAS/CPMN has more than 50 magnetometers mainly along the meridian of Japan and along the magnetic equator. Starting this year, the magnetometer data will be sent to Kyushu University in a real-time manner via special lines for Internet, telephone lines, or satellite-phone lines. By using this system, we will conduct the real-time monitoring and modeling of (1) the global three-dimensional current system and (2) the plasma density variations in the geo-space for space weather researches and applications. The ordinary magnetic data can be used for studies of long-term variations, e.g. magnetic storm, auroral substorms, Sq, etc., while the induction-type magnetic data will be useful for studies of ULF waves, transient and impulsive phenomena. We also started 24-hr FM-CW Doppler radar observation at Sasaguri near our campus from September, 2003, to measure the ExB drift velocity in the ionospheric F region, to know the nature of global penetration of polar electric fields into the daytime equatorial region, and to investigate the relationships among the MAGDAS data along the 210 magnetic meridian, the ExB drift velocity in the low-latitude ionosphere, and the interplanetary magnetic and electric field variations. In the present paper, we will show preliminary results from the MAGDAS/CPMN and FM-CW Doppler observations.