MAGDAS Project and Its Preliminary Results

Kiyohumi Yumoto[1]; Teiji Uozumi[2]; Shuji Abe[1]; Akihiro Ikeda[3]; misaki ito[4]; Yumoto Kiyohumi MAGDAS/CPMN Group[5]

[1] Space Environ. Res. Center, Kyushu Univ.; [2] SERC; [3] Earth and Planetary Sci.,Kyushu Univ.; [4] Earth and Planetary Sci., Kyushu Univ.; [5] -

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

The Space Environment Research Center (SERC), Kyushu University is installing the MAGnetic Data Acqusition System(MAGDAS)at 50 stations in the Circum-pan Pacific Magnetometer Network(CPMN)region, and several FM-CW radars along the 210-degree magnetic meridian. The MAGDAS project has the potential to contribute greatly to IHY/CAWSES by supporting ground-based magnetometer array for worldwide studies, and by demonstrating the beauty, importance, and relevance of space science to the world. 20 and 10 MAGDAS units were installed in collaborations with 30 organizations in the world, respectively, along the 210-degree magnetic meridian in 2005 and along the magnetic dip equator in 2006. In the year 2007, 10 MAGDAS units have been deployed in places such as Antarctica, South Africa, India, etc. The goal of MAGDAS is to become the most comprehensive ground-based monitoring system of the earth's magnetic field.

In the present paper, we will introduce preliminary results obtained from MAGDAS project; (1) long-term spectrum peaks of solar surface, solar wind parameters, geomagnetic indices, and MAGDAS data are compared to understand couplings of the solar wind-magnetosphere- ionosphere-atmosphere system. The spectrum peaks of 7.5,15,22, and 36-day period on the equatorial MAGDAS data mean a strong interaction of the atmospheric neutral wind with, and direct influence of solar radiations to the ionospheric Sq current system. (2) 160 quasi-periodic DP2 magnetic fluctuations, which were associated with the southward IMF, were identyfied at the dayside dip equator during December, 2006-March 2007. 36% of all the events are found to have simultaneous fluctuations in the nighttime, which show in-phase relationship to the daytime DP2. The nighttime DP 2 cannot be explained by using the penetration model of dawn-to-dusk electric field from the polar into the equatorial ionosphere. (3) Pi 2 magnetic pulsations at the world-widely separated stations near the dip equator are found to show an amplitude enhancement around each 10:00-13:00 local time. Low-latitude Pi 2 electric and magnetic pulsations observed by the MAGDAS and FM-CW radar show characteristics of radially propagating compressional and radially standing cavity modes. (4) From analysis of SC-associated electric fields observed by the FM-CW radar at Sasaguri, we found a superimposed effect of the polar electric field and the westward electric field of earthward compressions, which were caused simultaneously by the interplanetary shocks.