

## ICSWSE/ MAGDAS Project: Research for global electromagnetic coupling from polar to equatorial ionosphere

YOSHIKAWA, Akimasa<sup>1\*</sup> ; NAKAMIZO, Aoi<sup>2</sup> ; OHTANI, Shinichi<sup>3</sup> ; TANAKA, Yoshimasa<sup>4</sup> ; IMAJO, Shun<sup>5</sup> ; MATSUSHITA, Hiroki<sup>5</sup> ; CARDINAL, Maria gracita<sup>1</sup> ; ABE, Shuji<sup>1</sup> ; UOZUMI, Teiji<sup>1</sup> ; YUMOTO, Kiyohumi<sup>1</sup>

<sup>1</sup>International Center for Space Science and Education, Kyushu University, <sup>2</sup>Finish Meteorological Institute, <sup>3</sup>The Johns Hopkins University Applied Physics Laboratory, <sup>4</sup>National Institute of Polar Research, <sup>5</sup>Earth and Planetary Science, Kyushu University

International Center for Space Weather Science and Education (ICSWSE) has developed a real time magnetic data acquisition system (the MAGDAS project) for space environment monitoring around the world. The number of observational sites is increasing every year with the collaboration of MAGDAS host countries. Now at this time, the MAGDAS Project has installed 73 real time magnetometers so it is the largest magnetometer array in the world.

Applying equivalent current method to this network data, we analyze a global ionospheric current system from polar to equatorial ionosphere. Our results suggest that Dp2 type disturbances excited by solar wind variation, Pi2 type pulsations accompanied by auroral substorm onset process and Pc3 type pulsations accompanied by dayside cavity type oscillation show the same type of global current system, which are produced by primary bipolar electric field accompanied by field-aligned current system and Hall polarization electric field excited at the dawn-dusk conductivity terminator and at the magnetic dip equator. We will discuss how the electromagnetic coupling between polar and equatorial ionosphere is regulated by the formation of global Cowling channel in the ionosphere.

Keywords: Space Weather, Magnetosphere-Ionosphere-Atmosphere Coupling, Global Coupling