

## Region-2 field-aligned current and ring current ions during storm main phase: Arase and AMPERE observations

\*Shun Imajo<sup>1</sup>, Masahito Nose<sup>1</sup>, Ayako Matsuoka<sup>2</sup>, Satoshi Kasahara<sup>3</sup>, Shoichiro Yokota<sup>4</sup>, Mariko Teramoto<sup>6</sup>, Kunihiro Keika<sup>3</sup>, Brian Anderson<sup>5</sup>, Tetsuo Motoba<sup>5</sup>, Reiko Nomura<sup>7</sup>, Akiko Fujimoto<sup>8</sup>, Iku Shinohara<sup>2</sup>, Yoshizumi Miyoshi<sup>6</sup>

1. Data Analysis Center for Geomagnetism and Space Magnetism, Graduate School of Science, Kyoto University, 2. Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, 3. Graduate School of Science, The University of Tokyo, 4. Graduate School of Science, Osaka University, 5. The Johns Hopkins University Applied Physics Laboratory, 6. Institute for Space-Earth Environmental Research, Nagoya University, 7. Tsukuba Space Center, Japan Aerospace Exploration Agency, 8. International Center for Space Weather Science and Education, Kyushu University

We present the first simultaneous in situ observation by the Arase satellite of the region-2 field-aligned currents (FACs) and the ring current during a storm main phase on 16 July 2017. The crossing of the postmidnight upward FAC with the maximum current density of  $60 \text{ nA/m}^2$  at  $L \sim 4.2$  and  $MLAT \sim 20^\circ$  was determined by a change in the azimuthal magnetic field. The peak of the FAC density was located in the inner part of the ring current derived from the plasma pressure. The current driven by the oxygen pressure significantly contributed to the ring current density, in particular in the inner part. The FAC density value and invariant latitude in the inner magnetosphere were consistent with the corresponding FAC on the ionosphere derived from the AMPERE (Active Magnetosphere and Planetary Electrodynamics Response Experiment), indicating a connection of FAC between these regions.

Keywords: magnetic storm, ring current, field-aligned current, magnetospheric-ionospheric coordinated observation