



Multi-point Magnetic Field Observations of Field-Aligned Currents from Swarm Constellation Mission

Guan Le (1), Peter Chi (2), Hermann Lühr (3), Jesper Gjerloev (4), Claudia Stolle (3), Jaeheung Park (3), and Jan Rauberg (3)

(1) NASA Goddard Space Flight Center, Space Weather Laboratory, Greenbelt, United States (Guan.Le@nasa.gov), (2) UCLA, Los Angeles, CA, USA, (3) GFZ, German Research Centre for Geosciences, Potsdam, Germany, (4) Johns Hopkins University/Applied Physics Laboratory, Laurel, MD, USA

In this paper, we report the results of case studies of multi-point magnetic field measurements of field-aligned currents (FACs) from Swarm constellation mission to understand their temporal characteristics and hemispheric asymmetry. For science operations (since April, 2014), the three spacecraft were placed in slightly different polar orbits: Swarm B spacecraft in a higher altitude orbit (507km x 512km) and Swarm A and C side-by-side in lower altitude orbits (459km x 462km). In the beginning of the science operational phase, the longitudinal separations of the orbital planes were small, and Swarm A/C pair and Swarm B were nearly out of phase in the orbit. This unique orbit configuration provides opportunities to study some new features of FACs. Specifically, the Swarm satellites make multiple crossings of a FAC region within a few hours. Such data enable us to study temporal variations in several time scales, from 1 minute up to about 3 hours. Furthermore, the three satellites make nearly simultaneous observations of FACs in northern and southern hemispheres, which provide us an opportunity to study the hemispheric asymmetry.