

Particle precipitation characteristics in the dayside four-sheet field-aligned current structure

Genta Ueno[1], Tomoyuki Higuchi[2], Shin-ichi Ohtani[3]

[1] ISM, [2] Inst. Stat. Math., [3] JHU/APL

We study the statistical characteristics of four-sheet structures of large-scale field-aligned currents (FACs) with a list of FACs which is constructed by applying an automatic procedure [Higuchi and Ohtani, 2000] to the magnetic field data obtained by DMSP-F7, 12, 13, 14, and 15 satellites. A number of selected four-FAC-sheet events was 1341 in the northern hemisphere and 1897 in the southern hemisphere. In this study we focus on the dayside four-sheet FAC events and examine the corresponding magnetospheric regions utilizing an identification list based on precipitating particle data [Newell et al., 1991]. The most equatorward FAC sheet is mainly contributed by particles from the CPS region in all local time from 6 MLT to 12 MLT. In the other three FAC sheets at higher latitudes, corresponding region is mainly BPS in the dawnside and LLBL near the noon. Near the noon, mantle originated particles are also seen in the most poleward sheet. On the other hand, we cannot identify such transition of CPS, BPS, LLBL, and mantle regions in the duskside four-sheet FACs. In the duskside, there are no precipitating particles in the most equatorward sheet and the BPS particles are seen in the higher latitude three FACs.