

## Generation of field-aligned currents in the tail plasma sheet

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To understand the structure and dynamics of field-aligned current (FAC) system is one of important subjects in the solar-terrestrial physics. Many investigations on the FACs have been conducted by utilizing magnetic field measurements. In this paper, we discuss the generation mechanism of FACs based on long-term measurements of plasma and magnetic field by GEO-TAIL. We examined the average MHD structure of equatorial tail plasma sheet. FACs were estimated by using conservation of momentum and current. Pressure gradient is dominant to determine the pattern of FAC. FACs are downward on the dawnside and upward on the duskside. This structure is consistent with the polarity of FACs in the polar ionosphere. The pattern of FAC depends on the north-south component of interplanetary magnetic field (IMF). FAC in the near-Earth region is upward during northward IMF and downward during southward IMF. The polarity of FACs is explained by the distribution of pressure and magnetic field in the equatorial plasma sheet. We also report on the effect of substorms on the pattern of FACs during southward IMF.