

サブストーム時の静止軌道におけるプラズマ動態

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Substorm-time plasma properties at geosynchronous orbit

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Geosynchronous orbit is located near the inner edge of the plasma sheet, and is an ideal location to study the delivery of plasma sheet plasma and the coupling between the magnetosphere and ionosphere through the auroral field line. We present some case studies of plasma properties at geosynchronous orbit during substorms, using the Magnetospheric Plasma Analyzer (MPA) instruments onboard Los Alamos National Laboratory (LANL) satellites. A typical example showed that, (1) plasma density (both electrons and ions) began to increase about 20 min before the substorm onset and showed maximum value just before the onset, and then they decreased, (2) electron and ion temperatures were rather constant during the growth phase and suddenly increased at the onset, and (3) temperature anisotropy showed different manner between electrons and ions: $T_{\text{perp}}/T_{\text{para}}$ of electrons began to decrease about 20 min before the substorm onset, and $T_{\text{perp}}/T_{\text{para}}$ of ions showed sudden decrease just at the onset for a short time. These variations of plasma density, temperature, and anisotropy during substorm would be the manifestation of the global magnetospheric development and local M-I coupling process. We will show detailed plasma properties at geosynchronous orbit during substorms and discuss the substorm process around the inner edge of the plasma sheet.