

Geotail observations of dayside magnetopause reconnection II

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Plasma velocity distributions perpendicular to the magnetic field are generally isotropic by Larmor motion of ions and electrons. In actuality, isotropic velocity distributions are observed by Geotail. However, anisotropic ion velocity distributions were observed in the magnetosheath nearby the magnetopause when Geotail crossed the dayside magnetopause and observed ion flow jets by magnetic reconnection. The Geotail data of ion Energy-Time spectrogram on July 6, 2013 indicate anisotropic velocity distributions of ions energies higher than 20 keV at 0330 UT. The Geotail orbit is from magnetosheath through the magnetopause to the magnetosphere. The spacecraft GSM coordinates at the time of anisotropic ion velocity distribution observation are (9.8, 3.0, -0.2) R_E . This Geotail position is in the magnetosheath nearby the magnetopause. Ion energies are about 1 keV in the distant magnetosheath from the magnetopause. There are no ions with energies higher than 10 keV in the magnetosheath. There are ions with energies higher than 20 keV in magnetosphere. Thus, these ions are considered to go out toward the magnetosheath from the magnetosphere. We explain anisotropic ion velocity distributions by reconnecting magnetic field geometry.

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