

The structure of magnetopause

Yoshitaka Takebe[1], Tsugunobu Nagai[2]

[1] Earth and Planetary Sci., Tokyo Institute of Technology, [2] Dept. Earth & Planet. Sci.

We studied the plasma and magnetic field structure of the magnetopause with Geotail data. At the Magnetopause, magnetic field, plasma bulk velocity, density and temperature change. Magnetopause is not stationary but it changes its position and thickness with the Interplanetary Magnetic Field (IMF) and phenomena near the magnetopause. At the magnetosheath side edge of the magnetosphere, there is a boundary layer of plasmas in which magnetosphere plasmas with low density with a high temperature change into magnetosheath plasmas with high density with a low temperature gradually. There, Geotail observes transient southward or northward plasma flows. When Geotail observes the flow, the magnetopause changes the position earthward. Magnetic field also change in the magnetosheath and the magnetosphere. There is a magnetic field boundary at the magnetosheath side edge of the plasma boundary layer. We studied the structure of the magnetopause by dividing the cases. In the cases without the flow, IMF is mostly northward. In the cases with the flow, IMF is usually southward and the flow occurs when the south (z) component of IMF changes. Comparing southward IMF cases and northward IMF case, we found that in southward IMF case, the changes of magnetic field strength and direction are clear. While magnetic field strength and direction change gradually and it is difficult to distinguish between magnetosheath field and magnetospheric field in the northward IMF case.