

Dynamics of Low-Energy Ions and Electrons in Mercury's Magnetosphere: A Comparison Between Mio's First and Second Flybys

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The first two Mercury flybys by Mio have revealed new aspects of the highly dynamic magnetosphere of Mercury. Near the magnetopause and bow shock, rapid fluctuations of particle fluxes were detected at unprecedentedly high-time resolutions. In the nightside magnetotail, we identify periodic variations in the ion and electron fluxes. In the inner part of the magnetosphere, Mio observed complicated energy-time structures such as energy dispersions and inverted V's. A comparison of the data from the two flybys indicates that Mercury's magnetosphere was in completely different states, presumably resulting from different solar wind conditions. The high-quality plasma data with a help of magnetic field measurements obtained by Mio enable us to investigate the boundary dynamics, low-frequency wave activity, and substorm-related processes to an extent not achieved by the previous missions. We report up-to-date results from the ongoing efforts of data analysis regarding Mio's first two Mercury flybys.

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