



Comparative magnetotail flapping: An overview of selected events at Earth, Jupiter and Saturn

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A comparison of magnetotail flapping (the up-and-down wavy motion) between the Earth and the two giant planets Jupiter and Saturn has been performed through investigation of the current sheet normal of the magnetotail. Magnetotail flapping is commonly observed in the Earth's magnetotail. Due to single spacecraft missions at the giant planets, the normal is determined through minimum variance analysis of magnetometer data during multiple intervals when the spacecraft crossed through the current sheet. It is shown that indeed a case can be made that magnetotail flapping also occurs at Jupiter and Saturn. Calculations of the wave period using generic magnetotail models show that the observed periods are much shorter than their theoretical estimates, and that this discrepancy can be caused by unknown input parameters for the tail models (e.g. current sheet thickness) and by possible Doppler shifting of the waves in the spacecraft frame through the fast rotation of the giant planets.