



Jovian Substorms: Comparison with their Terrestrial Counterparts

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The apojoove of the Galileo Spacecraft spent several orbits in the near-jovian magnetotail. Strong southward or northward field turnings were observed and reported by Russell et al (1998) during these passes. These sudden dipolarizations were interpreted as signatures of tail reconnection similar to that seen in terrestrial substorms. In this paper, we examined all Jovian tail magnetic-field observations, identified all southward and northward turnings indicative of tail reconnection and determined the occurrence rate and location of reconnection events. In addition, we examined the strength of the magnetic field in the tail. We find changes that are clearly due to solar wind dynamic pressure variations but we also find the Jovian tail field strength increases before reconnection events and decreases after them. This behavior of the tail field around reconnection events is similar to the growth phase and expansion phase of terrestrial substorms but is much longer in duration, lasting several days. However, this growth phase must be due to endogenic causes, the storage of mass loaded flux tubes in the magnetotail. Thus substorms in the jovian tail both resemble terrestrial substorms but at the same time are quite different.