

Saturn's magnetotail dynamics: A study of reconnection signatures

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Abstract

The Pioneer 11 (1979), Voyager 1 (1980) and Voyager 2 (1981) spacecraft glimpsed Saturn's magnetotail on their flybys and provided the first clues as to its character and extent. Subsequently the Cassini spacecraft at Saturn (2004-2017 as currently planned) has shed huge light on this fascinating and complex environment. In particular the deep tail orbits of 2006 provided an opportunity to study dynamics such as magnetic reconnection in the tail, and to sample injections and changing plasma flows in situ. I will provide an overview of my work on Saturn's magnetotail, with a strong focus on magnetotail reconnection, including observations of plasmoids, travelling compression regions and dipolarizations. I will describe the statistical properties of reconnection signatures in situ, and explain the effects of reconnection on global magnetospheric dynamics at Saturn. I will list open questions for the future exploration of Saturn's tail.

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