



Substorms at Saturn: Growth phase, triggering, dipolarization and plasmoid formation

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Cassini magnetic field observations in the Saturn magnetotail show that the Saturn magnetosphere undergoes a magnetic cycle in many respects similar to that of the Earth. At times there is a noticeable increase in the tail magnetic field strength prior to the sudden change in the north-south component of the tail field. Almost always there is a decrease of the magnetic field strength after sudden change. The majority of these events occur when Titan is close to midnight Saturn local time. There are both southward turnings, dipolarizations, and northward turnings, plasmoid formations. That these events are due to rapid reconnection is evident in the azimuthal component of the magnetic field that shows the effects of angular momentum conservation when the plasma moves rapidly inward or outward. This importance of angular momentum conservation for dynamic events in a rapidly rotating system is one of the important lessons from the saturnian and jovian magnetosphere.