



Giant closed field line vortices in the nightside magnetosphere of Saturn

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Recent results suggest that the characteristic length of plasmoids in the Kronian system is much larger than earlier estimates. The recurrence time of disconnection events is longer than the rotation period of the planet, which implies that the field lines observed at the nightside outer magnetosphere may be connected to the dayside hemisphere of the planet. This has significant consequences regarding azimuthal plasma motion and global magnetospheric structure. We show that the nightside closed field lines form giant vortices, the plasma whirling around in these vortices never reaches the dayside. The azimuthal plasma motion is prograde at lower latitudes, but it is retrograde at high enough latitudes. Cassini data provides strong observational evidence for the existence of these structures.