Comparison of the mass-release processes at Jupiter and Earth.

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The study using Energetic Particles Detector and magnetometer measurements on Galileo discovered that the corotational flow inherent for the Jovian magnetosphere is disrupted by radially outward and inward particle bursts in the magnetotail. These bursts are associated with transient bipolar south-north magnetic field distortions and were reffered to the reconfiguration events at Jupiter and they are very similar to terrestrial substorms in terms of the characteristic features. The reconfiguration process in the magnetotail consists of a transition from a "quiet" (loading) state to a "disturbed" state. In analogy with the terrestrial substorm process the initial "loading" phase resembles characteristics of the growth (loading) phase and the "disturbed" phase (unloading) resembles the expansion phase of terrestrial substorms. The recovery phase of the Jovian reconfiguration process seems to be very short in relation to the other phases similar as in the terrestrial case. A closer look at the substorm-like processes in the Jovian magnetosphere also reveals further features similar to the terrestrial substorms, such as the onset of magnetic fluctuations on a time scale of an ion gyroperiod in the magnetotail, plasma sheet boundary layer formation, signatures of travelling compression regions and the formation of a post plasmoid plasma sheet. The signatures of cross-tail and field-aligned current generations during the reconfiguration process (e. g. potential drop, reversed dispersion of ions and electrons, timing of reconfiguration events) support the substorm scenario.