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Tail reconnection, from Earth to Jupiter to Saturn

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Reconnection is an important magnetospheric process that energizes and transports plasmas. Studies of the terrestrial magnetosphere have shown that tail reconnection plays a critical role in initiating substorms. Discovery of jovian tail reconnection and the associated growth phase indicate the substorm nature of jovian tail dynamic events. The growth phase of jovian substorms is caused by the internal processes, i.e., the mass-loading at Io torus, while that of terrestrial substorms is caused by the addition of energy through dayside reconnection with the solar wind. Similar to Jupiter, Saturn is a fast-rotating body whose magnetosphere has a strong internal mass-loading source. Tail reconnection events, reported in the saturnian tail, which may cause substorm-like process in that magnetosphere. In this study, we investigate the properties of saturnian tail reconnection events with Cassini data and compare them with jovian substorms to examine if they exhibit substorm-like behavior. And if so, what drives this phenomenon at Saturn? Finally we investigate further the reported triggering of substorms by the appearance of Titan near midnight.