



The ring current during sawtooth oscillations: Data-model comparisons for 2 events

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Data analysis and modeling results of the inner magnetosphere are used to examine the response of the ring current to sawtooth oscillations. Sawtooth oscillations are periodic substorm-like events that often occur during the passage of interplanetary coronal mass ejections (ICMEs). Two storm events will be considered, those on April 18, 2002 and on October 22, 2001. In both events, the sawtooth oscillations occurred during the midst of an ICME passing by Earth. In situ (LANL MPA and SOPA), remote sensing (IMAGE HENA), and ground-based (magnetometer) data will be presented, along with simulation results from a kinetic particle transport model (the RAM code). It is shown that the ring current exhibits unusual responses to sawtooth oscillations. A repeated feature is that, following the dipolarizations, SYM-H recovers while the observed hot ion fluxes intensify. The modeled Dst, however, is affected very little by these intensifications. Several discrepancies exist between the data and the model results, and the relative data-model relationship is not consistent between the events.