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Magnetospheric Plasma Conditions During Periodic Substorms[1]
W. HORTON, University of Texas at Austin, E. SPENCER, Utah State University — Sawtooth events in the period between 1998-2006 are input into the low-dimensional WINDMI physics model to obtain the statistical average of the energy content in the earth's ring current, central plasma sheet and geotail lobes. The input to the model are solar wind parameters obtained from the ACE spacecraft, while the output are the AL index and Dst index. We use a database of events to constrain the WINDMI model physics parameters. The model predicts the geotail lobe magnetic energy, the plasma sheet electric field and plasma sheet pressure that results in the triggering of periodic substorms. The relative timing between the electric field, magnetic field and plasma sheet pressure during the triggering and the growth phase of the substorms are presented. We show that for certain fixed states, the response of the magnetosphere depends on the level of solar wind forcing. We also present the differences in magnetospheric plasma conditions between periodic substorms and isolated substorm events, all under southward IMF conditions.

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