

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Analysis of the October 3-7 2000 Geomagnetic Storm¹ E. SPENCER, W. HORTON, Univ. of Texas at Austin, I. DOXAS, Univ. of Colorado at Boulder, J. KOZYRA, Univ. of Michigan at Ann Arbor — The 8 dimensional plasma physics model WINDMI is used to analyze the October 3-7, 2000 geomagnetic storm using solar wind input data from the ACE satellite. This period contains an extended interval of well-defined and quasi-periodic auroral activations called sawtooth oscillations, a phenomena whose relationship to substorm processes and to upstream solar wind drivers is still under debate. The model predicts both the occurrence of 8 auroral activations identified as sawtooth events during the 24 hour period on the 4th of October, and also an earlier multiple sawtooth interval on the 3rd of October, in agreement with the measured AL index. These intervals occur during steady but moderate solar wind IMF Bz values and the periodicity of the sawtooth events was not directly related to any periodic features in the upstream solar wind. The model also predicts the geomagnetic Dst index through the main and recovery phase of the storm. A genetic algorithm optimization routine was used to tune the parameters of the model to obtain a solution that has low ARV with respect to the AL index and also captures the eight substorms. Preliminary results of the analysis of the April 15-24 2002 storm are also presented.

¹The authors acknowledge NSF grants ATM-0229863, ATM-0402163 and NASA grant NNG05GJ89G.

W. Horton
The University of Texas at Austin

Date submitted: 19 Jul 2005

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