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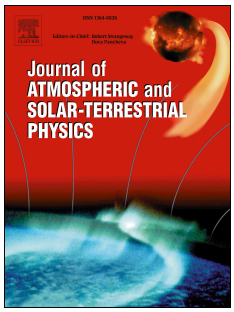


Storm phase–partitioned rates and budgets of global Alfvénic energy deposition, electron precipitation, and ion outflow

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ACCEPTED MANUSCRIPT

# Storm phase–partitioned rates and budgets of global Alfvénic energy deposition, electron precipitation, and ion outflow

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**Abstract**

We review the role of Alfvén waves in magnetosphere-ionosphere coupling during geomagnetically active periods, and use three years of high-latitude FAST satellite observations of inertial Alfvén waves (IAWs) together with 55 years of tabulated measurements of the *Dst* index to answer the following questions: 1) How do global rates of IAW-related energy deposition, electron precipitation, and ion outflow during storm main phase and storm recovery phase compare with global rates during geomagnetically quiet periods? 2) What fraction of net IAW-related energy deposition, electron precipitation, and ion outflow is associated with storm main phase and storm recovery phase; that is, how are these budgets partitioned by storm phase? We find that during the period between October 1996 and November 1999, rates of IAW-related energy deposition, electron precipitation, and ion outflow during geomagnetically quiet periods are increased by factors of 4–5 during storm phases. We also find that ∼62–68% of the net Alfvénic energy deposition,

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