

WAVE GENERATION AND ELECTRON ACCELERATION DURING SUBSTORMS

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Energetic ions and electrons with hundreds of keV energy are frequently observed in the near Earth tail during magnetospheric substorms. We have examined the sources and acceleration of electrons and ions during a magnetospheric substorm by using THEMIS observations and numerical simulations. After substorm onset the THEMIS spacecraft located in the near-Earth tail observed large fluxes of energetic ions and electrons up to 500 keV. The flux increases were observed within a few minutes of dipolarization at different spacecraft. In each case the dipolarization was accompanied by intense electrostatic and electromagnetic waves. Similar wave activity was found associated with dipolarization during several substorms in the near-Earth tail region. In this talk we will use particle in cell simulations to evaluate the importance of the waves for electron acceleration and to understand the global implications for electron energization during substorms.

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