

Electron Energization during Dipolarization Events: Test Particle Simulations

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In this research, we have developed a test particle simulation code to examine the electron energization during multiple dipolarization events. The Tao-Chan-Brizard guiding center model was implemented to evaluate the trajectories of 0.1, 1, 10 keV electrons with different initial pitch angles and L -shells. The time-varying magnetic field model was evaluated by the Tsyganenko model TS05 with the corresponding inductive electric field. Dipolarization events are characterized by an enhancement in particle energy in the nighttime magnetosphere. The increase in the magnetic field and the corresponding induced electric field can energize and transport the particles earthward, which can explain the mechanism of the particle flux enhancement in the inner magnetosphere. Numerical results will be compared with THEMIS measurements.

Keywords: Dipolarization, Electron Energization, Test Particle Simulations, Tsyganenko Model, Inductive Electric Field