

THREE-DIMENSIONAL DIFFUSION SIMULATION OF OUTER RADIATION BELT ELECTRONS DURING THE OCTOBER 9, 1990, MAGNETIC STORM

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Relativistic (> 1 MeV) electron flux increases in the Earth's radiation belts are significantly underestimated by models that only include transport and loss processes, suggesting that some additional acceleration process is required. Here we use a new, 3D code that includes radial diffusion and quasi-linear pitch angle and energy diffusion due to chorus waves, including cross terms, to simulate the October 9, 1990, magnetic storm. The diffusion coefficients are activity dependent, and time-dependent boundary conditions are imposed on all six boundary faces, taken from fits to CRRES/MEA electron data. Although the main phase dropout is not captured well, good agreement with the data is found during the recovery phase, but only if radial transport and chorus are both included.

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