

Non-diffusive response of outer belt electrons on interplanetary shock

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Test particle simulation is performed in the electric and magnetic fields given by a global magnetohydrodynamics (MHD) simulation. When an interplanetary shock strikes the magnetosphere, a compressional wave propagates tailward. Pre-existing relativistic electrons that are initially located at fixed radial distances are redistributed by the electric and magnetic fields associated with the compressional wave. When the electrons encounter the nightside, they undergo complicated paths under the complicated distribution of the electric and the magnetic fields. Consequently, a group of isolated electrons forms, suggesting non-diffusive response. We discuss the redistribution processes in terms of the magnetospheric processes.

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