

# Characteristic Solar Wind Dynamics Associated With Geosynchronous Relativistic Electron Events

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We report the results on the investigation of the association of solar wind dynamics and the occurrence of geosynchronous relativistic electron events. This study analyzed  $E > 2\text{MeV}$  electron fluxes measured by GOES 10 satellite and solar wind parameters by ACE satellite for April, 1999 to December, 2002. Most of the relativistic events during the time period are found to be accompanied by the prolonged period of quiet solar wind dynamics which is characterized as low solar wind pressure, weak interplanetary magnetic field, and fast fluctuations in IMF Bz. These results imply that solar wind dynamics may play an important role in the occurrence of the geosynchronous relativistic events, suggesting the following scenario for the relativistic events: (i) some acceleration mechanism(s) generate a large population of relativistic electrons in the inner magnetosphere (ii) extremely quiet solar wind dynamics provide a stable, more dipole-like magnetospheric configuration yielding the geosynchronous orbit well inside the trapping boundary of the relativistic electrons (iii) the generated MeV electrons can be effectively accumulated in the trapped region leading to high electron fluxes at geosynchronous orbit. As the relativistic events strongly depend on solar wind conditions, predicting the solar wind variations would be as important as understanding the electron acceleration mechanism(s) in the forecast of relativistic events.