

Science objectives of the ERG satellite mission

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It has been known that the energetic particles in the ring current and radiation belts are drastically changed during magnetic storms. The mechanisms of variation, however, are still poorly known. In order to investigate the acceleration process of relativistic particles in the inner magnetosphere and the global dynamics of Geospace, the ERG satellite mission is proposed. Comprehensive observations of particle, fields and waves are necessary to understand key process of particle acceleration. The radial profile of phase space density is important to determine which of physical processes is most responsible for the energization of the outer radiation belt. Moreover, the measurements of both electric and magnetic component of plasma waves together with thermal plasma environment are necessary to evaluate particle acceleration mechanism of non-adiabatic process. The ERG satellite will be launched into a geosynchronous transfer orbit with small inclination during next solar maximum, and the satellite will observe particles of a wide range of energies with fields and waves. The combination with ground based networks such as SuperDARN, CPMN magnetometers and optical measurements are also planned in the ERG project. The results from the ERG project will make an important contribution to understand particle acceleration and global dynamics in Geospace.