

Magnetic Field Experiment in the Inner Magnetosphere by ERG

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The acceleration process of the charged particles in the inner magnetosphere is considered to be closely related to the deformation and perturbation of the magnetic field. Accurate measurement of the magnetic field is required for the understanding of the acceleration mechanism of the charged particles, which is one of the major scientific objectives of the ERG mission. We are designing a fluxgate magnetometer which is optimized to investigate following topics;

(1) accurate measurement of the background magnetic field - the deformation of the magnetic field and its relationship with the particle acceleration.

(2) MHD waves - measurement of the ULF electromagnetic waves of frequencies about 1mHz (Pc4-5), and investigation of the radiation-belt electrons radially diffused by the resonance with the ULF waves.

(3) EMIC waves - measurement of the electromagnetic ion-cyclotron waves of frequencies about 1Hz, and investigation of the ring-current ions and radiation-belt electrons dissipated by the interaction with the EMIC waves.

A fluxgate magnetometer (MGF) will be installed on the ERG satellite to measure DC and low-frequency magnetic field. The design is based on MGF-I, one of the magnetometers for MMO, Mercury orbiter, which would also suffer high radiation on the Mercury orbit.

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