

The ERG Project: Japanese geospace exploration to elucidate the dynamics of the inner magnetosphere

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<http://www2.nict.go.jp/y/y223/IM/index.html>

For the purpose to study the unresolved major problems underlying in Geospace, ERG (Energization and Radiation in Geospace) project has been proposed being focused on the evolution of radiation belts associated with geomagnetic storms. The project consists of three parts; the ERG satellite, the ERG ground network, and the ERG modeling/data center. The ERG satellite is designed to make in-situ observation of the storm-time particles and fields to evaluate the adiabatic and non-adiabatic processes which control the dynamics of relativistic particles. The instruments on-board are assigned as: (i) measurement of the distribution functions of electrons and ions in wide energy range such as 10eV to 10MeV for electrons and 10eV to 1MeV for ions, (ii) measurement of DC electric and magnetic fields with resolution of 0.1mV/m and 0.1nT, and (iii) measurement of electric and magnetic components of plasma waves in a frequency range from 1Hz to 5MHz. The ERG project also involves ground-based network facilities of optical instruments, Super-DARN HF radars, and magnetometers, making it possible to obtain two-dimensional distribution of ionospheric and magnetospheric disturbances. The ERG modeling/data center is the facility to examine these comprehensive satellite and ground data by comparing with the results of computer simulation of particles and fields in the Geospace. The ERG project team is also planning to collaborate with THEMIS, RBSP (NASA) and ORBITALS (Canada) missions. The ERG proposal was submitted to ISAS/JAXA in 2007 as a category of small-scale satellite mission. Feasibility studies in pre-phase A are currently carried out.