

The Japanese satellite mission ERG for Geospace research and applications

K. Shiokawa (1), Y. Miyoshi (1), K. Seki (1), T. Ono (2), M. Hirahara (3), T. Takashima (4), K. Asamura (4), Y. Kasaba (4), A. Matsuoka (4), T. Obara (5), and the ERG project team

(1) Solar-Terrestrial Environment Laboratory, Nagoya University (shiokawa#stelab.nagoya-u.ac.jp, fax:+81-533-89-1539), (2) Tohoku University, (3) Rikkyo University, (4) ISAS/JAXA, (5) NICT

Energetic particles in the ring current and radiation belts drastically change during magnetic storms. Study of the energetic particle is an exciting subject not only for the space plasma physics but also for the space weather. Comprehensive observations of particles, fields, and waves are necessary to understand key processes of particle acceleration in Geospace. Measurements of both electric and magnetic components of plasma waves in a wide frequency range together with thermal plasma environment are necessary to evaluate non-adiabatic acceleration processes of relativistic particles.

In order to investigate global plasma dynamics in Geospace including the acceleration processes of relativistic particles, the small satellite mission, ERG (Energization and Radiation in Geospace), was proposed in Japan. The ERG satellite will be launched into a geosynchronous transfer orbit with small inclination during next solar maximum, and the satellite will observe particles in a wide energy range from a few eV to 10 MeV with measurement of ion species. The satellite will also observe fields and waves for both electric and magnetic components in a wide frequency range. Combinations with ground-based networks such as SuperDARN, CPMN magnetometers, and optical instruments and with global modeling efforts of Geospace, are considered in the ERG project. It will be also possible to have international collaborative observations with LWS/RBSP and ORBITALS satellites during the same period and to contribute to the International Living With a Star (ILWS) program. The data from the ERG satellite can be correlated with these other simultaneously operating projects, in order to address scientific issues in Geospace and to contribute to new understandings of space weather.