

The small satellite mission ERG

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For the purpose of study on the unresolved major problems underlying in geospace, a small satellite mission named as ERG (Energization and Radiation in Geospace) is proposed being focused on the temporal variation of the radiation belt associated with magnetic storms. A comprehensive measurement of particles and fields on-board a small satellite is planned based on the heritage of the achievement of previous and undergoing Japanese scientific satellite missions. The on-board scientific instruments are arranged to make definitive evaluation of possible mechanisms. The on-board instrumentation is characterized as following; (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 observation facilities of optical measurements (6 stations), Super-DARN HF radars (10 stations), 210 deg. meridian magnetometer chain (25 stations) and CPMN chain (10 stations), which make it possible to detect responses of geomagnetic and ionosphere disturbances associated with geomagnetic storms. Theory and data analysis group analyze the comprehensive data set comparing with results of computer simulation to achieve new understanding of the geospace, based on the structure, electro dynamics and wave-particle interactions carried out in the geospace plasma. The ERG project team is planning to collaborate with ORBITALS (Canada) and RBSP (NASA) missions.

At present, the ERG proposal has already been submitted to ISAS/JAXA as a category of small scale satellite mission. The ERG satellite WG has been established inside ISAS as categorized as a mission of pre-phase-A.