

ジオスペース探査計画：ERGプロジェクト

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Geospace Exploration Project:ERG

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The ERG (Exploration of energization and Radiation in Geospace) is a geospace exploration project in Japan. The project focuses on dynamics of Geospace and accelerations of radiation belt electrons in the context of the cross-energy coupling. The project consists of the satellite observation team, the ground-based network observation team, and integrated-data analysis/simulation team. The ERG satellite will be launched in this fiscal year. The satellite apogee and perigee altitudes are 5.2 Re and 300 km, respectively, and the orbital period is about 8 hour. Comprehensive instruments for plasma/particles, and field/waves are installed in the ERG satellite. Two ion instruments (LEP-i/MEP-i) measure ions from 10 eV/q to 180 keV/q with mass discrimination. Four electron instruments (LEP-e/MEP-e/HEP/XEP) measure electron from 12 eV to 20 MeV. LEP-i/MEP-i and LEP-e/MEP-e/HEP can measure three-dimensional distribution functions. The plasma wave instrument (PWE) measures electric fields as well as plasma waves in the frequency range from DC to 10 MHz (electric field) and 100 kHz (magnetic field). The fluxgate magnetometer (MGF) measures DC and low frequency magnetic field. Newly developed wave-particle interaction analyzer (S-WPIA) is installed in the satellite, which measure directly the energy transfer process between electrons and plasma waves. S-WPIA will provide definitive evidence on wave-particle interactions in space plasma, which is essential to understand elementary process of electron accelerations.

Several ground-network teams join; magnetometer networks, radar networks including SuperDARN and EISCAT, VLF antenna network, optical imager networks, riometer network, standard radio wave observation network, which provide a global view of geospace and complementary observation with the ERG satellite observation. Japanese STP community has prepared the ground-based observation facilities and networks to collaborate with the ERG satellite over the years. The new big project for the ground-network observations PWING and PsA have just started in this year. Moreover, the modeling/simulations play an important role for the quantitative understanding. Besides research teams in the project, the science center has been operated. All science data from the project have been archived in the ERG-Science Center. The science center has also developed integrated data analysis software that is a plug-in for SPEDAS in cooperation with the THEMIS mission. These data and softwares are available via the ERG-Science Webpage (<http://ergsc.isee.nagoya-u.ac.jp>).

In this presentation, we will talk about an overview of the ERG project and discuss a plan for the initial observation after the ERG launch. The international collaborations with Van Allen Probes, MMS, THEMIS, Cluster, etc and ground network observations under the flame work of Heliosphere/Geospace (H/GSO) system observatory are also discussed.