

## **Development of Plasma and Particle instrument package of the ERG satellite mission**

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ERG (Energization and Radiation in Geospace) satellite mission is proposed in Japan to investigate the particle acceleration process and their propagation. The energetic particle acceleration process in the ring current and radiation belts is important, but many fundamental questions still remain to be solved. The key to the in-situ observation by spacecraft is to obtain the continual energy spectrum from 10 eV to a few 10 MeV, to measure ion species and pitch the angle distributions for magnetic field lines under the strong radiation field and the high-count rate environment, when magnetic storms occur. However, The acceleration process and source of high energy particles in storms have not been well known because of the lack of ion data with medium-energy from several 10 keV to ~ a few 100keV. We have been developing a Medium energy Particle spectrometer (MEPi/MEPe), which can measure energy (E), mass (m), and charge state (q) of each ion in the mediumenergy range with TOF by E technique, in order to fill the energy gap around several 10 keV. We are to obtain continual energy spectrum from 10eV to 10MeV using a plasma and particle package of the ERG satellite mission.

On the other hand, as for the high-energy particles by magnetic storms, the contamination of high-energy particles has been included in the data of the low energy plasma instruments because they have been possible to penetrate the wall of the instruments. The way to make the wall of the detector thick, and so on, is impossible in the small satellite to consume a weight resource (passive shield). Therefore, the contamination of high-energy particles can be rejected under the strong radiation environment without consuming a weight resource by the new development of the active way to take the coincidence of several signals (active shield).

We will make a presentation on the progress in the plasma and particle package developments and our future plan.

Keywords: plasma instrument; high-energy particle; inner magnetosphere; radiation belt