

Development of the high energy electron detector for ERG satellite.

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Outer space including the radiation belt near the earth is called Geospace. In this region, human make activities such as satellites and astronauts. However, high-energy particles are also accelerated in this region. During the magnetic storm the dynamic change such as sudden increase of the charged particle is seen and this has negative effect on human body and satellites. Further information is needed to reveal the nature of this region in detail and improve space weather prediction.

To investigate the Geospace, smallsat ERG is planned. In these years, the use of the smallsat on scientific researches broadens. There are many merits of smallsats like saving man power, construction in short term, and with low cost. Despite these merits, the small satellites have demerit in its small capacity. ERG satellite is the first satellite to observe particles and electromagnetic waves at the same time over the continuous energy band in Geospace. Because of its small capacity, each detector must be compact in order to be loaded in the satellite. One purposes of ERG mission is to reveal the acceleration mechanism of high energy particle in the radiation belt. To achieve this purpose, ERG observes electrons directly which is thought to be accelerated to high energy electrons. HEP-e which is a detector to observe the electrons has large field of view and high angular resolution. In addition, HEP-e must have the sensitivity and radiation resistance to observe the electrons under the circumstance of strong radiation. Besides, it must also be small. In this study, I will show the present conditions of the HEP-e development. Then I will argue about miniaturization, radiation resistance, and detection performance.