

## Electric field and plasma wave observation in the inner magnetosphere by the ERG satellite

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In order to clarify the global plasma dynamics in geospace, ERG (Energization and Radiation in Geospace) mission has been proposed by Japanese researchers. As part of feasibility study of ERG mission, specifications of plasma waves receiver and electric field detector onboard the small satellite has been investigated. The main purposes of electric field and plasma wave observation of the ERG satellite are as follows: (1) Examination of the theories of relativistic particle acceleration by plasma waves, (2) identification of the origin of electric fields in the inner magnetosphere, (3) diagnosis of plasma density, temperature and composition in the plasmasphere by waves, and (4) investigation

of wave-particle interaction and mode conversion processes in the inner magnetosphere. In order to achieve above purposes, it is planned that the instrument consists of crossed dipole antenna, stem antenna, search-coil antenna, and loop antenna as electromagnetic sensors, electric field detector, two plasma wave receivers, and wave particle correlator. Stem antenna and loop antenna are option at the present stage. Simultaneous observation of plasma waves and energetic particles with high resolution in the magnetic equator region will enable us to investigate the wave-particle interaction associated with relativistic electron dynamics based on quasi-linear theory and non-linear models. Furthermore, direct identification of nonlinear wave-particle interactions associated with generation of whistler-mode chorus, which contributes relativistic electron accelerations, will be tried by wave-particle correlator.