

## ERG/PWE: Plasma Wave Experiment - from Mercury (BepiColombo/MMO-PWI) to Earth's Radiation Belt

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The Plasma Wave Experiment (PWE) aboard the ERG mission, just in the design phase, is introduced.

PWE will observe the electric field (from DC to 10 MHz) and magnetic field (from few to 100 kHz) for the clarification of global plasma dynamics, energetic processes, and wave-particle interactions in the radiation belt. It is based on the FM design of Plasma Wave Investigation (PWI) aboard BepiColombo Mercury Magnetospheric Orbiter (MMO), which FM is just now tested at ISAS.

Some parts are also extended to the future Jovian mission studies with European and US colleagues.

The key issues are: (a) Examination of the theories of high-energy particle acceleration by plasma waves, (b) Diagnosis of plasma density and temperature, and (c) Investigation of wave-particle interaction and mode conversion processes. Those issues were produced from the long researches by ISAS Akebono satellite from 1989 to now.

PWE provides the waveform and spectrum of electric field (2 components) and magnetic field (3 components).

The signal is also served to the MDP, and analyzed by the Software Wave Particle Correlator (S-WPIA).

The coordinated analyses with magnetic field and low/mid/high energy plasma particles by this on-board data correlation efforts will add the key information of the contribution of plasma waves to the relativistic particle acceleration in the radiation belt, under the coordination with the RBSP mission.

Keywords: ERG, electric field, plasma wave, radio wave, wave-particle interaction, radiation belt