

PEM030-P08

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## Development of a time-of-flight ion mass analyzer for ERG / SCOPE

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We are developing a low-energy ion mass spectrometer (energy range: 0.01-25keV/q, mass coverage: H<sup>+</sup>, He<sup>++</sup>, He<sup>+</sup>, O<sup>+</sup>, angular resolution: 22.5deg) which is planned to be onboard ERG / SCOPE.

The instrument is composed of an electrostatic and a time-of-flight (TOF) analyzers, which measures energy per charge (E/q) and flight time (t) of incoming particles inside the analyzer, respectively. Mass per charge (M/q) can be deduced by measured parameters E/q and t.

Significant fluxes of high-energy particles (MeV range or more) have been observed especially in the inner-magnetosphere. They can penetrate through and/or emit high-energy photons inside instrument walls which are typically made of aluminum alloy. When they reach a detector located inside the instrument. They can be detected because of non-zero quantum efficiency, even if their energies are highly deviated from designed energy coverage of the instrument.

In order to reduce the background noise due to high energy particles, the instrument are designed with minimization of detection areas, a time-of-flight coincidence technique, and a thick passive shield. Laboratory experiment with a test model is on-going currently. Numerically calculated characteristics in comparison with experimental results will be reported.