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**ポスター 1 : 9/24 PM1/PM2 (13:45-18:15)**

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## **Development of suprathermal ion energy-mass spectrometer for observations in the polar ionosphere**

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In the inner magnetosphere, there are oxygen ions, nitrogen ions, and molecular ions which flow out from the ionosphere along the earth's magnetic field line. The cold ionospheric ions with energies below several eV are heated to tens of eV, which has been observed by the past satellite observations. However, possible mechanisms for the ion outflow have not been understood. While the pressure gradient drives the outflow of light ions such as protons and helium ions, the mechanism is difficult for heavy ions such as oxygen ions and molecular ions. In order to clarify the ion outflow mechanism, we are developing suprathermal ion energy-mass spectrometer for the LAMP-2 sounding rocket experiments and the future polar orbiting satellite mission "FACTORS". There are two objectives for in-situ observations of suprathermal ions in the topside ionosphere. The first is to clarify the outflow mechanism for heavy ions originated from the ionosphere. The second is to identify heating mechanisms, e.g., wave-particle interactions and joule heating at the ionospheric altitudes. The instrument consists of an electrostatic energy-per-charge analyzer and a TOF (Time-Of-Flight) based mass analyzer using the linear-electric field (LEF) method. The LEF method provides much finer mass resolution comparing to the normal (field-free) TOF analyzer. Design of the instrument is being optimized with numerical simulations in which particle trajectories inside the instrument are traced. In this presentation, we will report on the current status of the development and future plan..