Contribution ID: **30** Type: **Poster**

Beam energy spread of a filament-type Penning Ionization Gauge Ion Source for a compact ion microbeam system

Thursday, 11 September 2025 11:15 (1h 45m)

A filament-type penning ionization gauge ion source with small power consumption and low energy spread (FPIG) has been developed for a compact ion microbeam. In this microbeam system, a duoplasmatron-type ion source with a filament (DpIS) has, so far, been used to produce submicron beams. The DpIS can generate low energy ion beam with a low beam energy spread. However, the DpIS consumes electric power over 1 kW to heat a Thoriated Tungsten filament and cool electrodes heated by the filament. This power consumption is a barrier for the compact ion microbeam system to be used in many research and industrial fields. In general, typical PIGs have large beam energy spread over several ten electron-volts that are large to form ion microbeams although they have small electric power consume. One of the reasons to generate the beam energy spread is considered to supply electrons for plasma by impacting the ions to the cathodes. In this study, FPIG has been developing using a thin tungsten wire for small power consumption as electron supply. In the preliminary study, the tendency of the low energy spread of hydrogen ion beams generated by FPIG was obtained using a beam energy analyzer of a parallel electroplate type. In this presentation, the property of FPIG will be represented based on the beam energy spread.

Primary author: Dr ISHII, Yasuyuki (National Institutes for Quantum Science and Technology)

Co-author: Dr OHKUBO, Takeru (National Institutes for Quantum Science and Technology)

Presenter: Dr ISHII, Yasuyuki (National Institutes for Quantum Science and Technology)

Session Classification: Poster Session

Track Classification: Beam formation, extraction, and transport