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## Development of a Penning Gauge Ion Source with a Filament for a Compact Ion Microbeam System

A penning ion source with a filament has been developed for a compact ion microbeam system to form sub-micron ion beam. A duoplasmatron-type ion source has, so far, been used for the system. However, the duoplasmatron-type ion source is large power consumption as well as a large size. It is an obstacle to reduce the size of the system. As an ion source to overcome the demerits, a penning gauge ion source, as referred to "PIG ion source", is a candidate of a suitable ion source for the system. If a typical PIG ion is used, the usage of its source is difficult to form a microbeam. Therefore, a PIG ion source has been developed the system. The key feature of the ion source is beam energy spread to form a submicron beam width. The spread is caused by discharge voltage to generate plasma in the ion source. One of the methods to generated the plasma is the usage of a filament. Thus, a PIG ion source with a filament has mainly developed in this study. In the presentation, the features of the developed PIG ion source will be reported.

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