

## 負イオン源のプラズマ電極バイアス特性 Response of Electron to Plasma Grid Bias in Negative Ion Source

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In negative ion sources for fusion experiments, the negative ion is extracted with the electron, so-called co-extracted electron, and the plasma grid (PG) is positively biased relative to the plasma chamber to suppress the co-extracted electron current. In previous studies, it is observed that the co-extracted electron current gradually decreases with increasing the bias voltage while the negative ion current remains constant at low bias voltage. However, it has not been well understood how the electron in the plasma chamber response to the bias voltage because the plasma in the ion source is weakly magnetized and Langmuir probe has difficulty in obtaining the electron density precisely at such condition.

Recently, we have utilized the surface wave probe, which is based on the resonant spectroscopy, and successfully obtained the electron density in the large-scaled negative ion source [1]. In addition, the electron density distribution along the axis perpendicular to the PG was obtained in the pure-volume and cesium seeded plasmas at various bias voltages. In this paper, we will discuss the response of the electron to the grid bias and relation of the electron in the plasma chamber with the co-extracted electron current in different negative ion production processes.

[1] M. Kisaki, K. Tsumori, *et al.*, Rev. Sci. Instrum. **83**, 02B113pp. 1-4 (2012).