



Contribution ID: 54

Type: **Poster (by default)**

Enhanced Production of Multicharged Ions by Mixing Low Z Gas and Emittance Measurement on Electron Cyclotron Resonance Ion Source

We have been studying efficient production of multicharged ions in an electron cyclotron resonance ion source (ECRIS). The gas mixing method, in which low Z gas is mixed into produced plasma, is known as a relatively simple method for highly efficient production of multicharged ions. In addition, it is expected that heating low Z ions selectively by ion cyclotron resonance (ICR) will further improve the efficient production of multicharged ions. Although the principle of the gas mixing method is not yet fully understood, it is considered to be due to the cooling effect by collisions between ions. It is necessary to obtain parameters related to the ion temperature in order to experimentally confirm the ion cooling effect. Therefore, we obtained parameters by emittance measurements using the wire probe and multi slit for ion beams. In this experiment, He was mixed as a low Z gas into the Ar plasma as an operating gas, and the charged state distribution of the ion beams was measured to confirm the increase in the multicharged ions due to the gas mixing effect. We have also conducted emittance measurements on the multicharged Ar ion beams and compared the value of root mean square emittance with and without He mixing. In the future, we plan to conduct heating low Z ions selectively by ICR by introducing low frequency electromagnetic waves, and to investigate the characteristics of ion beams by emittance measurements.

Funding Agency

Email Address

I have read the Code of Conduct to attend ICIS2023.

Presenter if not the submitter of this abstract

Primary author: FUJIMURA, Yushi (Osaka Univ.)

Co-authors: IWAHARA, Kouki (Osaka Univ.); KATO, Yushi (Osaka Univ.)

Presenter: FUJIMURA, Yushi (Osaka Univ.)

Session Classification: Tuesday

Track Classification: Beam Formation, Extraction, Transport, and Diagnostics