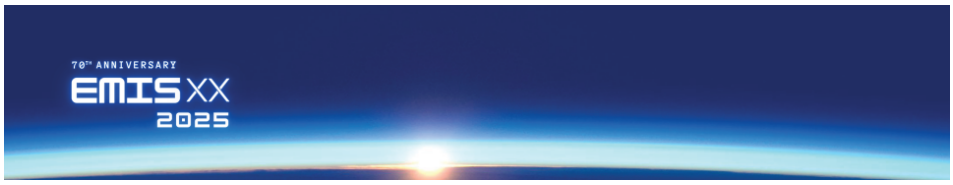

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Development of high-purity and high-density RI stational targets using an electron-beam modulated EBIT

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The development of the Self-Confining Radioactive Isotope Target (SCRIT) [1] has enabled generation of stationary targets from rare, short-lived nuclei, thus permitting a wide range of nuclear reaction experiments. We use the EBIT technique to generalize the RI stationary target. Conventional operation using an Electron Beam Ion Trap (EBIT), however, also captures light residual gas ions such as O^{1+} ($m/q \approx 16$), leading to reduced purity of the radioactive isotope target.
In this paper, a new pulsed operation technique is proposed to temporally modulate the electron beam in the EBIT. Peak current, pulse frequency and duty are tuned so that ionization is halted once ^{132}Sn ions reach the $6+$ charge state. In this situation, residual gas ions are unstable for trapping and only heavy ions with mass to charge ratio above that of residual gas remain trapped.
This approach makes it possible to gain almost complete control over the ion charge state distribution and to achieve a substantial increase in target purity. Detailed description of the principle and experimental validation will be presented at the conference.

Email address

kagami.rin.47d@st.kyoto-u.ac.jp

Supervisor's Name

Masanori Wakasugi

Supervisor's email

wakasugi.masanori.8z@kyoto-u.ac.jp

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Primary author: KAGAMI, Rin

Co-author: WAKASUGI, Masanori (Kyoto University)

Presenter: KAGAMI, Rin

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