

Research Facility Development Division
Accelerator Group
Accelerator R&D Team

1. Abstract

We are developing the key hardware in upgrading the RIBF accelerator complex. Our primary focus and research is charge stripper which plays an essential role in the RIBF accelerator complex. Charge strippers remove many electrons in ions and realize efficient acceleration of heavy ions by greatly enhancing charge state. The intensity of uranium beams is limited by the lifetime of the carbon foil stripper conventionally installed in the acceleration chain. The improvement of stripper lifetimes is essential to increase beam power towards the final goal of RIBF in the future. We are developing the low-Z gas stripper. In general gas stripper is free from the lifetime related problems but gives low equilibrium charge state because of the lack of density effect. Low-Z gas stripper, however, can give as high equilibrium charge state as that in carbon foil because of the suppression of the electron capture process. Another our focus is the upgrade of the world's first superconducting ring cyclotron.

2. Major Research Subjects

- (1) Development of charge strippers for high power beams (highly oriented graphite film, low-Z gas)
- (2) Upgrade of the superconducting ring cyclotron
- (3) Maintenance and R&D of the electrostatic deflection/inflexion channels for the beam extraction/injection

3. Summary of Research Activity

(1) Development of charge strippers for high power beams (foil, low-Z gas)

(H. Hasebe, H. Imao, H. Okuno)

We are developing the charge strippers for high intensity heavy ion beams. We are focusing on the developments on highly oriented carbon graphite films and gas strippers including He gas stripper.

(2) Upgrade of the superconducting ring cyclotron

(J. Ohnishi, H. Okuno)

We are focusing on the upgrade of the superconducting ring cyclotron.

(3) Maintenance and R&D of the electrostatic deflection/inflexion channels for the beam extraction/injection

(J. Ohnishi, H. Okuno)

We are developing high-performance electrostatic channels for high power beam injection and extraction.

Members

Team Leader

Hiroki OKUNO

Research/Technical Scientists

Hiroshi IMAO (Senior Research Scientist)

Hiroo HASEBE (Technical Scientist)

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Visiting Scientists

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HAYASHIZAKI (Tokyo Tech)

Part-time Worker

Yoshiki SHIKUMA (Research Part-time Worker II)

List of Publications & Presentations

Publications

[Original Papers]

H. Imao, "Charge stripper ring for RIKEN RI beam factory," J. Instrum. **15**, P12036 (2020).