1. Abstract
Aiming at stable and efficient operation of the RIBF cascaded cyclotron system, Beam Dynamics and Diagnostics Team develops power supplies, beam instrumentation, computer control and beam dynamic studies. We have successfully increased the beam availability for user experiments to more than 90%. We have also established small-beam-loss operations. The latter strongly contributes to recent high-power operations at RIBF.

2. Major Research Subjects
(1) More efficient and stable operations of the RIBF cascaded cyclotron system
(2) Maintenance and developments of the beam instrumentation
(3) Developments of computer control system for more intelligent and efficient operations
(4) Maintenance and improvements of the magnet power supplies for more stable operations
(5) Upgrade of the existing beam interlock system for high-power beams with few tens of kW

3. Summary of Research Activity
(1) High-intensity heavy-ion beams such as 117-pnA uranium, 173-pnA xenon, 486-pnA krypton, 788-pnA Zinc and 740-pnA calcium beams have been obtained.
(2) The world-first high-Tc, SQUID beam current monitor has been developed.
(3) The bending power of the fixed-frequency Ring Cyclotron has been upgraded to 700 MeV.
(4) The world-most-intense V beams are stably supplied to super-heavy-element-search experiments.
(5) The RIBF control system has been operated stably by replacing legacy hardware controllers carried over from our old facility with new ones. Several useful operation tools are also developed.
(6) The dated power supplies exciting the main coils of RIKEN Ring Cyclotron has been upgraded to a new one having a better long-term stability than the old ones.
(7) Developments of automatic beam tuning methods based on recent machine-learning technology and adaptive control are in progress.

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List of Publications & Presentations

Publications

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