

Operational Experience of the High-power Production Target System for BigRIPS Separator

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The high-power production target system of the superconducting RI beam separator BigRIPS [1,2,3] at RI beam factory (RIBF) was constructed in 2007 and has been successfully operated since then with the beam powers up to 8 kW. The system was designed to withstand the energy loss of 22 kW in a Be target of 5.4mm (1g/cm²) thickness for a ²³⁸U beam at 345 MeV/nucleon and 1 particle μ A (82 kW in a beam power). The spot size of the primary beam at the production target is about 1 mm in a diameter. Therefore the power density in the target becomes high with 28 kW/mm² on the target surface and with 5.2 kW/mm³ in the target volume. A water-cooled rotating disk target was developed to cope with such high power density. Stationary targets mounted on a water-cooled ladder were also provided for low intensity beams.

In the meeting, operational experiences of the water cooled rotating targets as well as the stationary targets will be presented together with the temperature measurements of the beam spot for various beam powers up to 8 kW. The maintenance system of the target will also be discussed.

References

- [1] A. Yoshida et. al.: Nucl. Instr. Meth. A 521, 65 (2004).
- [2] A. Yoshida et. al.: Nucl. Instr. Meth. A 590, 204 (2008).
- [3] A. Yoshida et. al.: Nucl. Instr. Meth. A 655, 10 (2011).

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