

THE SCRIT ELECTRON SCATTERING FACILITY AT RIKEN RI BEAM FACTORY

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SCRIT (Self-Confining radioactive isotope target) is a novel technique to form internal targets in an electron storage ring using the transverse potential produced by the electron beam and the longitudinal barrier potential applied to electrodes. After the successful demonstration of the validity and the performance of this technique, the SCRIT electron scattering facility has been constructed at RIKEN RI Beam Factory to realize electron scattering with short-lived unstable nuclei, which requires the unstable nuclei target and high luminosity.

This facility consists of a racetrack microtron, an electron storage ring with the SCRIT system, and a low-energy RI separator. A buffer-gas free buncher system was also installed in the ion transport line between the RI separator and the SCRIT system. Recently, a scattered electron spectrometer and a luminosity monitor were completely constructed.

For the RI production, the photofission of uranium is used. In the present, the rate of ¹³²Sn was 2.6×10^5 atoms/s with 15-g uranium and a 10-W electron beam.

The optimization of the SCRIT system has been carried out using the stable ¹³²Xe ion produced in the RI separator, and maximum luminosity was achieved to about $3 \times 10^{27} \text{ cm}^{-2} \text{ s}^{-1}$ with 240-mA electron beam and 3×10^8 injected ions. Consequently, we have succeeded for the first time in measuring the angular distributions of electron elastic scattering for ¹³²Xe at several electron beam energies and obtaining the charge density distribution of ¹³²Xe.

In this contribution, we will report the present status and discuss the technical performance of the SCRIT facility.