

## THE PERFORMANCE OF THE SCRIT DETECTORS FOR ELECTRON-RI SCATTERING EXPERIMENT

Akitomo Enokizono<sup>1</sup>, Kousuke Adachi<sup>1</sup>, Takahiro Fujita<sup>1</sup>, Masahiro Hara<sup>2</sup>, Mitsuki Hori<sup>1</sup>, Toshitada Hori<sup>2</sup>, Shin-ichi Ichikawa<sup>2</sup>, Kazuyoshi Kurita<sup>1</sup>, Tetsuya Ohnishi<sup>2</sup>, Toshimi Suda<sup>3</sup>, Tadaaki Tamae<sup>3</sup>, Kyo Tsukada<sup>3</sup>, Mamoru Togasaki<sup>1</sup>, Masanori Wakasugi<sup>2</sup>, Masamitsu Watanabe<sup>2</sup>, Kouhei Yamada<sup>1</sup>

<sup>1</sup>Department of Physics, Rikkyo University, Ikebukuro, Tokyo, 171-8501, Japan

<sup>2</sup>RIKEN Nishina Center, Wako, Saitama 351-0198, Japan

<sup>3</sup>Research Center for Electron-Photon Science, Tohoku University, 1-2-1 Mikamine, Sendai, 981-0928, Japan

The charge density distributions of stable isotopes have been extensively measured by electron elastic scattering experiments and provided important parameters to establish nuclear structure models. Such essential parameters, however, have never been measured for short-lived radioisotopes (RIs) due to the technical difficulties of preparing target to achieve a reasonably high luminosity for the electron-RI scattering experiment. The SCRIT (Self-Confining Radioactive isotope Ion Target) facility has been constructed at RIKEN to make the electron-RI scattering experiment possible for the first time in the world.

At SCRIT, the angular momentum distribution of scattered electrons is measured by WiSES (Window-frame Spectrometer for Electron Scattering) which consists of a dipole magnet and front/rear drift chambers, covering a solid angle of  $\sim 80$  mSr with an intrinsic momentum resolution of  $\Delta p/p \sim 10^{-3}$ . The calibrations and performance study of WiSES have been carried out using a tungsten wire installed inside the SCRIT chamber. To evaluate the absolute cross-section of electron-RI scattering, the luminosity is obtained from the bremsstrahlung photons measured by LMon (Luminosity Monitor) which is located  $\sim 7$ m downstream of SCRIT chamber. The LMon consists of 7 CsI calorimeters to measure the photon energy, and plastic fiber scintillators to measure the 2D hit distribution of photons. In 2015-2016 the first physics experiment has been performed using  $^{132}\text{Xe}$  target, then the luminosity and angular distributions are successfully measured at the electron beam energy of 150-300MeV, achieving a luminosity above  $10^{27} \text{ cm}^{-2}\text{s}^{-1}$ . In this contribution, we present the performances of the WiSES and LMon detectors in detail.