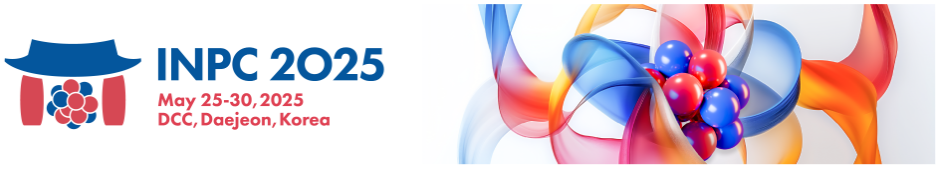

Contribution ID: **306** Type: **Invited Talk for Parallel Sessions (Invitation Only)**

SCRIT electron-scattering facility for short-lived exotic nuclei

Tuesday, 27 May 2025 08:30 (25 minutes)

Electron scattering has long been regarded as the gold standard for probing nuclear structures, playing a crucial role in uncovering the internal composition of atomic nuclei and shaping our modern understanding of their properties. Until recently, however, its application has been strictly confined to stable nuclei, leaving short-lived unstable nuclei entirely unexplored*.

After nearly two decades of development, we have recently achieved a groundbreaking milestone: the first electron scattering experiment on an online-produced radioactive isotope at the SCRIT electron-scattering facility of the RIKEN RI Beam Factory in Japan**.

The SCRIT facility, designed specifically to investigate the internal structures of short-lived exotic nuclei via electron scattering, leverages the innovative SCRIT (Self-Confining Radioactive Isotope Ion Target) technique***. With as few as ~10^7 ions of an exotic nucleus, this technique enables a luminosity of approximately 10^{27} /cm^2/s—sufficient to conduct elastic electron scattering on medium-heavy nuclei.

In this presentation, I will highlight recent achievements and the current status of the SCRIT facility while also discussing the broad range of research opportunities the SCRIT facility may open for future exploration.

- T. Suda and H. Simon, Prog. Part. Nucl. Phys. 96 (2017) 1-31. ** K. Tsukada et al, Phys. Rev. Lett. 131 (2023) 092502. Physics Today 76 (11), 14–16 (2023). *** M. Wakasugi, T. Suda and Y. Yano, Null. Instrum. Methods A532 (2004) 216.

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Session Classification: Parallel Session

Track Classification: New Facilities and Instrumentation