NUSTAR special Seminar

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Low-energy electron-scattering facilities for nuclear physics in Japan

An overview of the two groundbreaking low-energy electron-scattering facilities for nuclear physics in Japan, which we have constructed and are operating today, will be presented. I will discuss the facility details, their current status, and the physics program pursued at these facilities.

1) ULQ2 facility in Sendai (ULQ2 : Ultra-Low Q2)

proton and deuteron charge radii, RMS radius of the neutron distribution of ^{208}Pb
electron beam : E_e = 10 - 60 MeV (q = 5 - 120 MeV/c)
60-MeV e-linac, twin spectrometers with 4k-ch silicon strip detectors.

2) SCRIT facility at RIKEN (SCRIT : Self-Confining Radioactive-isotope Ions Target)

charge density distribution of short-lived exotic nuclei.
electron beam : E_e = 150 - 300 MeV (q = 80 - 300 MeV/c)
ISOL (^{238}U Photofission), electron storage ring, large-acceptance spectrometer.

Furthermore, I would also like to discuss a new physics opportunity, recently pointed out [1,2,3], to determine the RMS radius of the neutron distribution in atomic nuclei by electron scattering. Our ongoing efforts and methodologies involved in extracting the neutron RMS radius through low-energy electron scattering at both facilities will be introduced.

[1] H. Kurasawa and T. Suzuki, Prog. Theor. Exp. Phys., 2019, 113D01, https://doi.org/10.1093/ptep/ptz121
[2] H. Kurasawa, T. Suda and T, Suzuki, Prog. Theor. Exp. Phys., 2021, 013D02, https://doi.org/10.1093/ptep/ptaa177
[3] H. Kurasawa and T. Suzuki, Prog. Theor. Exp. Phys. 2022 023D03, https://doi.org/10.1093/ptep/ptac008

Convener: H. Simon
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