

New Scientific Opportunities with the TRIUMF ARIEL e-linac



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Low-energy electron scattering facilities in Japan - SCRIT for exotic nuclei and ULQ2 for proton and stable nuclei-

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I will introduce low-energy electron scattering facilities for nuclear physics that we have constructed in Japan.

1) SCRIT facility at RIKEN RI Beam Factory

(SCRIT : Self-Confining Radioactive-isotope Ions Target)

the world's first electron scattering facility dedicated to short-lived exotic nuclei. $E_e = 150 - 300$ MeV, $q = 80 - 300$ MeV/c.

Luminosity $\sim 10^{27}$ /cm²/s with NRI $\sim 10^8$ /s.

ISOL (Photofission), electron storage ring, large-acceptance spectrometer.

2) ULQ2 facility at Tohoku

(ULQ2 : Ultra-Low Q2)

$E_e = 10 - 60$ MeV.

60-MeV e-linac, twin spectrometers with 4k-ch silicon strip detectors.

keyword : Proton charge (magnetic) radius. Nuclear charge form factor at extremely low q .

I will discuss the facility details, current status, and the physics program to be pursued at these facilities, including a ground-breaking new physics opportunity, recently pointed out [1], to determine the RMS radii of the neutron distribution of exotic nuclei at SCRIT and of stable nuclei at ULQ2.

references

1) H. Kurasawa and T. Suzuki, Prog. Theor. Exp. Phys., 2019, 113D01, <https://doi.org/10.1093/ptep/ptz121>

H. Kurasawa, T. Suda and T. Suzuki, Prog. Theor. Exp. Phys., 2021, 013D02, <https://doi.org/10.1093/ptep/ptaa177>

H. Kurasawa and T. Suzuki, Prog. Theor. Exp. Phys. 2022 023D03, <https://doi.org/10.1093/ptep/ptac008>

Attendance

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Scheduling Constraints

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