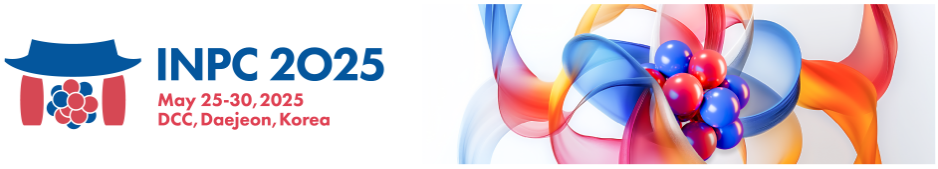

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Superallowed Alpha Decay of 104Te

Tuesday, 27 May 2025 12:00 (15 minutes)

The double-magic nature of ^{100}Sn generates the island of α-emitters northeast of this N=Z=50 nucleus. The increase of energy-corrected α-decay probabilities was considered to be a signature of enhanced α particle preformation and led to the term "superallowed" α decay for nuclei in the region [1]. The N=Z=52 ^{104}Te is predicted to be the fastest α emitter. Auranen et al. measured ^{104}Te and found that it is likely a very short-lived nucleus characterized by much-increased preformation, even compared to other nuclei in the region [2]. Due to the limited statistics, the authors could only place an upper limit on the half-life based on the measurement of the decay chain of ^{108}Xe. Here, we will report the results of the direct measurement of the ^{104}Te half-life. We used a fast-response, scintillator-based charged-particle detector to measure the decay of ^{108}Xe, which populates ^{104}Te. We utilized the projectile fragmentation of a high-intensity ^{124}Xe beam at RIKEN Radioactive Ion Beam Factory (RIBF) to produce the most ^{108}Xe nuclei to date. This work will present the experiment's results in the context of the numerous theoretical predictions for the decay of ^{104}Te.

[1] R. Macfarlane and A. Siivola, Phys. Rev. Lett. 14, 144 (1965)
[2] K. Auranen, et al. Phys. Rev. Lett. 121, 182501 (2018)

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Consent

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