



## Probing proton emitters using the MARA separator

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Using the fusion-evaporation reaction  $^{96}\text{Ru}(^{58}\text{Ni},p4n)^{149}\text{Lu}$  and the MARA vacuum-mode recoil separator we have identified a new proton-emitting isotope  $^{149}\text{Lu}$ . The measured decay Q-value of 1920(20) keV is the highest measured for a ground-state proton decay, and it naturally leads to the shortest *directly* measured half-life of  $450_{-100}^{+170}$  ns for a ground-state proton emitter. The decay rate is consistent with  $l_p = 5$  emission, suggesting a dominant  $\pi h_{11/2}$  component for the wave function of the proton-emitting state. Through non-adiabatic quasiparticle calculations we were able to conclude that  $^{149}\text{Lu}$  is the most oblate deformed proton emitter observed to date. In this talk I will discuss the experimental details and the already published results [1]. Additionally, we collected a good number of recoil-decay tagged  $\gamma$  rays feeding the proton decaying  $^{147}\text{Tm}$  and  $^{147m}\text{Tm}$ . The preliminary level schemes extracted from these data are also presented and discussed.

## Reference

- [1] K. Auranen et al., PRL **128**, 112501 (2022).