

# Sandbanks beyond the proton drip-line, x-ray bursts and the rp-process

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In this contribution we will discuss the observation of the previously unknown isotope  $^{72}\text{Rb}$ , with 14 observed events in BigRIPS and the ZeroDegree spectrometer during the EURICA campaign at RIKEN [1]. For context, the role of the neighbouring nuclei  $^{72}\text{Kr}$  and  $^{73}\text{Rb}$  will be discussed in their role as a waiting point in x-ray burst rp-process scenarios. The nonobservation of the less proton-rich nucleus  $^{73}\text{Rb}$  is consistent with the adapted upper limit of 30 ns. For  $^{72}\text{Rb}$ , however, we measure a half-life of 103 ns. This observation of a relatively long-lived odd-odd nucleus,  $^{72}\text{Rb}$ , with a less exotic odd-even neighbor,  $^{73}\text{Rb}$ , being unbound shows the diffuseness of the proton drip line and the possibility of sandbanks to exist beyond it. The  $^{72}\text{Rb}$  half-life is consistent with a  $5^+ \rightarrow 5/2^-$  proton decay with an energy of 800–900 keV, in agreement with the atomic mass evaluation proton-separation energy.

[1] H. Suzuki, et al. Phys. Rev. Lett., 119:192503, 2017.

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