

## Direct mass measurement of proton-rich Fe isotopes

The two-proton radioactivity ( $2p$  decay) is an exotic decay mode that was predicted theoretically in the 1960s and first discovered experimentally in 2002. Two protons are simultaneously emitted from the ground state of some neutron-deficient nuclei such as  $^{19}\text{Mg}$ ,  $^{45}\text{Fe}$ ,  $^{48}\text{Ni}$ , and  $^{54}\text{Zn}$ .

Because the two-proton emitters are very undatable, it is difficult to study their energy structure, and the mechanism of  $2p$  decay is not fully established.

In this research, we performed the direct mass measurement of  $^{45}\text{Fe}$  and the nucleus in its vicinity to reveal the energy structure and proton separation energy using the Tof-Brho method in the OEDO-SHARAQ beamline. We are aiming to evaluate the probability that two protons tunnel the potential barrier. The present status of the data analysis will be reported.

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