

Prize Talk PV IX Thu 9:00 Kurt-Alder HS Chemie
Two-proton radioactivity - status and perspectives — ●MAREK
PFÜTZNER — Faculty of Physics, University of Warsaw, Poland —
Laureate of the Smoluchowski-Warburg-Prize 2025

Ground-state two-proton ($2p$) radioactivity is a characteristic decay mode for isotopes of even- Z elements located beyond the two-proton drip line. So far, this exotic process has been experimentally observed in a few light- and medium-mass nuclides with $Z \leq 36$. In fact, ground-state, simultaneous two-proton emission is predicted to be observable for every even- Z element up to tellurium. Most of them, however, will be very difficult to reach in the near future. In the region between tel-

lurium and lead the particle instability is expected to be manifested by sequential emission of two protons. In addition to the ongoing search for new $2p$ emitters, an important research direction aims at precision studies of this exotic decay mode. The interesting question in this context is to what extent details of nuclear structure can be inferred from $2p$ decay observables. It is expected that the momentum correlations between the emitted protons may reveal the composition of the initial wave function. Work is in progress to investigate whether the $p-p$ correlations in the three classical cases ^{45}Fe , ^{48}Ni , and ^{54}Zn will shed light on the $Z = 28$ shell closure in this region of the nuclear chart.

In the talk, I will overview $2p$ radioactivity studies with a focus on recent experimental and theoretical developments.