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Searching for β-decaying isomers in neutron-deficient Pd isotopes

The region of neutron-deficient isotopes around the N = 50 shell-closure is a region where several very interesting nuclear structure phenomena occur. For example, a large number of high-spin, β-decaying isomers develop at high energy in the region south-west of ^{100}Sn, due to the large overlap between protons and neutron holes in the $g_{9/2}$ orbital. A summary of already observed spin-gap isomers can be found in [1], and shows the last known β-decaying isomer in Pd isotopes is in ^{95}Pd, with some high-spins isomers also observed in ^{94}Pd, but no β-branch observed. Such isomers offer a highly sensitive means of probing p-n interaction in the region. Once found using β-decay studies (either at DESIR using TULIP/S3 beams or as a first step directly at S3-LEB using IDEAS3), one can use the information to help further β-decay studies of Pd isotopes. Indeed, one of the capabilities DESIR will offer is the use of a Penning-trap before the decay station in order to separate isomers and study their decay. This LOI serves as a first step to trigger a trap-assisted β-decay program at DESIR to study the region south-west of ^{100}Sn. Pd isotopes are very interesting in that regard as high-spin β-decaying isomers are still to be observed reaching the N = Z line but are predicted and observed down to ^{95}Pd, and trap-assisted decay spectroscopy is not widely used in general, and in this region *a fortiori*.

[1] T. Faestermann, M. Górska, H. Grawe, The structure of ^{100}Sn and neighbouring nuclei, Progress in Particle and Nuclear Physics 69 85 (2013)

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