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Onset of oblate deformation in Pb isotopes

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A large body of experimental evidence and many theoretical models assessing shape-coexistence in the neutron-deficient Pb region has been acquired [1]. The quadrupole deformed shapes are associated with different intrinsic configurations that intrude down to energies close to the spherical ground state, resulting in a unique shape-triplet in ^{186}Pb [2,3]. In the shell-model picture, the intruder configurations are associated with 2p-2h and 4p-4h proton excitations across the $Z=82$ shell gap.

In this region, the onset of deformation along isotopic chains varies for different elements. For example, the onset of oblate deformation in Po isotopes starts surprisingly early [4]. Since the ground state in Pb isotopes is spherical, the onset of deformation can be assessed by investigating the excited 2^+ states associated with different shapes. In this talk, I will present our recent experimental program to shed light on this phenomenon. In particular, I will focus on simultaneous in-beam electron and γ -ray spectroscopy experiments employing the SAGE spectrometer [5] and lifetime experiments exploiting the APPA plunger device at JYFL, Finland.

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[3] J. Ojala et al., Commun. Phys. 5, 213 (2022).

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[5] J. Pakarinen et al., Eur. Phys. J. A 50: 53 (2014).

Auteur principal: PAKARINEN, Janne (University of Jyväskylä, Finland)

Orateur: PAKARINEN, Janne (University of Jyväskylä, Finland)

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