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Shape Coexistence in Odd Au Isotopes. Description within the Interacting Boson-Fermion Model framework.

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Abstract

This study investigates the coexistence of regular and intruder configurations in odd gold isotopes, the latter being proposed as a one-particle–one-hole excitation above the Z=82 energy gap [1].

Experimental data on the systematic of the energy spectra are analysed for the A=179–195 Au chain. The work employs the Interacting Boson–Fermion Model (IBFM) [2] to describe this behaviour, examining how the unpaired particle affects the collective core. The energy splitting arising from the boson–fermion interactions is presented, employing this vision to reproduce the systematics of the different bands [3].

Finally, the main aspects required to describe all the bands within a unified framework (the IBFM with Configuration Mixing) are discussed.

References:
[1] K. Heyde et al. “Coexistence in Odd-Mass Nuclei”. In: Physics Reports (Physics Letters)(1983).
[2] P. Van Isacker F. Iachello. “The Interacting Boson Fermion Model.” Cambridge Monographs onMathematical Physics, 1987.
[3] A.E.L. Dieperink R. Bijker. “Descriprion of odd-A Nuclei in the Pt Region in the Interacting Boson-Fermion Model”. In: Nuclear Physics (1982).

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