

Abstract Submitted
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Recent advances in the study of hyperdeformation at high spin¹

HAZEM ABUSARA, A.V. AFANASJEV, Mississippi State University — The systematic investigation of hyperdeformation (HD) at high spin in the $Z=40-58$ part of nuclear chart has been performed in the framework of the cranked relativistic mean field theory. The properties of the HD bands such as quadrupole transition moments Q_t , dynamic $J^{(2)}$ and kinematic $J^{(1)}$ moments of inertia have been studied. These observables are affected by centrifugal stretching. Our self-consistent calculations suggest that necking degree of freedom should play an important role in some nuclei at hyperdeformation. It is especially pronounced in the proton density distribution due to the repulsive Coulomb force. The density of the HD bands is high in the spin range where they are yrast or close to yrast in the majority of cases. In these cases the observation of discrete HD bands will most likely be impossible because the feeding intensity will be redistributed among many bands, thus, dropping below the observational limit of the experimental facilities. The calculations indicate Cd isotopes as the best candidates for a search of discrete HD bands. The HD configurations become yrast at lower spins in neutron-deficient nuclei than in the ones of the valley of β -stability. [1] W.Koepf and P.Ring, Nucl. Phys. A511, 279(1990), [2] A.V.Afanasjev and H.Abusara (submitted to Physical Review C)

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Hazem Abusara
Mississippi State University

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