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Global performance of covariant energy density functionals: ground state observables of even-even nuclei and error estimates[1]
SYLVESTER AGBEMAVA, A.V. AFANASJEV, D. RAY, Mississippi State University, P. RING, Technical University of Munich, Germany — Covariant density functional theory [1] is a modern theoretical tool for the description of nuclear structure phenomena. In this theory, the nucleus is described as a system of nucleons which interact by the exchange of various mesons. The goal of the current investigation is a first ever global assessment of the accuracy of the description of physical observables related to the ground state properties of even-even nuclei and establishing theoretical uncertainties in their description using the set of four modern covariant energy density functionals (CEDF) such as NL3*, DD-ME2, DD-MEδ and DD-PC1. Calculated binding energies, the deformations, radii and two-particle separation energies are compared in a systematic way with available experimental data [2,3]. The comparison of theoretical results obtained with these CEDFs allows to establish theoretical uncertainties in the description of physical observables in known regions of nuclear chart and extrapolate them towards neutron-drip line.

[1] D. Vretenar *et al*, Phys. Rep. **409**, 101 (2005).
[2] S. Agbemava, A. V. Afanasjev, D. Ray, and P. Ring, submitted to Phys. Rev. C.
[3] A. V. Afanasjev, S. Agbemava, D. Ray, and P. Ring, Phys. Lett. B 726, 680 (201).

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