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Reflection asymmetric shapes in covariant density functional theory[1] A.V. AFANASJEV, S. AGBEMAVA, Mississisippi State University, P. RING, Technical University of Munich, Germany — Reflection asymmetric (octupole deformed) shapes play an important role in some areas of nuclear chart. For example, the outer fission barriers in actinides and superheavy nuclei are strongly affected by such shapes [1]. The recent progress in the study of such shapes and octupole softness at ground states of lanthanides ($A \sim 145$) and actinides ($A \sim 224$) as well as at outer fission barriers of actinides and superheavy [1] nuclei within the covariant density functional theory [2] will be reviewed. New results obtained within the relativistic Hartree-Bogoliubov framework with separable limit of finite range Gogny D1S pairing in the pairing channel will be discussed. The experimental data will be systematically compared with model calculations. The work on the extension of the relativistic Hartree-Bogoliubov formalism to the description of odd, odd-odd and rotating nuclei with reflections asymmetric shapes is currently in progress. New results obtained with these extensions will be reported.

[1] H. Abusara, A. V. Afanasjev and P. Ring, Phys. Rev. C85, 024314 (2012).
[2] D. Vretenar, A. V. Afanasjev, G. A. Lalazissis, and P. Ring, Phys. Rep. **409**, 101 (2005).

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