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Landscape of pear-shaped even-even nuclei[1] SYLVESTER AGBEMAVA, YUNCHEN CAO, Michigan State University, ANATOLI AFANASJEV, Mississippi State University, WITOLD NAZAREWICZ, Michigan State University, ERIK OLSEN, Universite Libre de Bruxelles — Reflection asymmetric shapes play an important role in nuclear stability, spectroscopy, decays and fission. For this study, global analysis of ground-state octupole deformations for even-even nuclei with $Z \leq 110$ and $N \leq 210$ has been performed using nuclear density functional theory (DFT) with several non-relativistic and covariant energy density functionals. In this way, we can identify the best candidates for reflection-asymmetric shapes. The calculations are performed in the frameworks of axial reflection-asymmetric Hartree-Fock Bogoliubov theory and relativistic Hartree-Bogoliubov theory. We consider five Skyrme and four covariant energy density functionals. This allows us to better understand systematic trend of octupole instability throughout the nuclear landscape. Several regions of ground-state octupole deformation were predicted. In addition to the traditional regions of neutron-deficient actinide nuclei around ^{224}Ra and neutron-rich lanthanides around ^{146}Ba, we identified vast regions of reflection-asymmetric shapes in very neutron-rich nuclei around. ^{200}Gd and ^{288}Pu. Our analysis suggests promising candidates with stable ground-state octupole deformation, primarily in the neutron-deficient actinide region, that can be reached experimentally

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