

Abstract Submitted  
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**Systematic global study of charge radii and related indicators in covariant density functional theory.**<sup>1</sup> UDESHIKA PERERA, ANATOLI AFANASJEV, Mississippi State University, PETER RING, Technical University of Munich, Germany — A systematic global investigation of differential charge radii has been performed within the CDFT framework for the first time. Theoretical results obtained with conventional covariant energy density functionals and separable pairing interaction are compared with experimental differential charge radii in the regions of the nuclear chart in which available experimental data crosses neutron shell closures at  $N = 28, 50, 82,$  and  $126$ . It is shown that the kinks in the charge radii at neutron shell closures are due to the underlying single-particle structure and due to the weakening or collapse of pairing at these closures. It is usually assumed that pairing is a dominant contributor to odd-even staggering (OES) in charge radii. Our analysis paints a more complicated picture. It suggests a new mechanism in which the fragmentation of the single-particle content of the groundstate in odd-mass nuclei due to particle-vibration coupling provides a significant contribution to OES in charge of radii.

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