Abstract Submitted
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Single-particle degrees of freedom and pairing properties as sources of theoretical uncertainties in the position of the neutron drip line[1] SYLVESTER AGBEMAVA, ANATOLI AFANASJEV, DEBISREE RAY, Mississippi State University, PETER RING, Fakultät für Physik, Technische Universität München — The sources of theoretical uncertainties in the prediction of the two-neutron drip line are analyzed in the framework of covariant density functional theory [1-3]. We concentrate on single-particle and pairing properties as potential sources of these uncertainties [3]. The major source of these uncertainties can be traced back to the differences in the underlying single-particle structure of the various covariant energy density functionals (CEDF's). It is found that the uncertainties in the description of single-particle energies at the two-neutron drip-line are dominated by those existing already in known nuclei. Only approximately one-third of these uncertainties are from the uncertainties in the isovector channel of CEDF's. Thus, improving the CEDF description of single-particle energies in known nuclei will also reduce the uncertainties in the prediction of the position of the two-neutron drip line. The predictions of pairing properties in neutron-rich nuclei depend on the CEDF. Although pairing properties affect moderately the position of the two-neutron drip line they represent only a secondary source for the uncertainties in the definition of the position of the two-neutron drip line.

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Sylvester Agbemava
Mississippi State Univ

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