Building Relativistic Mean-Field Models for Atomic Nuclei and Neutron Stars WEI-CHIA CHEN, JORGE PIEKAREWICZ, Florida State University — Nuclear energy density functional (EDF) theory has been quite successful in describing nuclear systems such as atomic nuclei and nuclear matter. However, when building new models, attention is usually paid to the best-fit parameters only. In recent years, focus has been shifted to the neighborhood around the minimum of the chi-square function as well. This powerful *covariance analysis* is able to provide important information bridging experiments, observations, and theories. In this work, we attempt to build a specific type of nuclear EDFs, the relativistic mean-field models, which treat atomic nuclei, nuclear matter, and neutron stars on the same footing. The application of covariance analysis can reveal correlations between observables of interest. The purpose is to elucidate the alleged relations between the neutron skin of heavy nuclei and the size of neutron stars, and to develop insight into future investigations.

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