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Uncertainty Quantification for Nuclear Density Functional Theory[1] JORDAN MCDONNELL, NICOLAS SCHUNCK, Lawrence Livermore National Laboratory, WITOLD NAZAREWICZ, University of Tennessee, Knoxville, DAVE HIGDON, Los Alamos National Laboratory, JASON SARICH, STEFAN WILD, Argonne National Laboratory — Nuclear density functional theory exhibits good overall agreement with measured nuclear masses for medium-mass to heavy nuclei. But the predictions of various models diverge substantially near the neutron and proton drip lines. Quantifying the theory's inherent uncertainty is essential for making reliable predictions. Through a Bayesian analysis, we calculate the theoretical uncertainty for nuclear masses obtained with a Skyrme-class energy density functional. We also assess whether a recent set of mass measurements of neutron-rich nuclei reduces the uncertainty in this model's predictions near the neutron drip line.

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