Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Comparing the F-Spin Mass Model to Other Nuclear Mass Models[1] WILLIAM PORTER, ANDREW NYSTROM, ANI APRAHAMIAN, University of Notre Dame — Nuclear masses and binding energies play an important role in nuclear science and the applications of nuclear science such as nuclear astrophysics. The reliable prediction of nuclear masses far from stability are particularly important for a better understanding of the rapid neutron capture process. We are exploring the implementation of a semi-empirical mass model based on the concept of F-spin in nuclei. This model incorporates the evolution of shape in various regions of the chart of nuclides. Here, with the intent of better predicting nuclear binding energies near the bounds of our experimental knowledge, the F-Spin mass model uses a 9 parameter quadratic equation dependent on the third projection of F-Spin and proton number to evaluate the microscopic portion of all nuclear binding energies. We divide the known 2317 isotopes into 14 different zones for fitting purposes, we are able to generate predictions for nuclear masses in the order of 324 keV. The F-Spin model implied shapes are then compared with a number of other mass models to determine the variations in nuclear structure.

[1]This work is supported by the National Science Foundation under contract PHY-1205412.

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Date submitted: 25 Jul 2016 Electronic form version 1.4