

Abstract Submitted
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Proton - Neutron Interactions and The New Atomic Masses R.B. CAKIRLI, Yale University, Istanbul University, R.F. CASTEN, Yale University, D.S. BRENNER, Clark University, E.A. MILLMAN, Yale University — Proton - neutron interactions determine structural evolution with N and Z including the onset of collectivity, deformation, and phase transitions. We have extracted the interaction of the last proton and the last neutron, called δV_{pn} , from a specific double difference of binding energies using the new mass tabulation [1]. Striking variations are seen near closed shells. In the Pb region, these are interpreted using overlaps of shell model orbits, which are large when both protons and neutrons are in similar orbits, and small when they are not. Further, we used the idea that shell filling follows a typical systematic pattern to look at the correlation of δV_{pn} values to the fractions of the proton and neutron shells that are filled. These results provide useful signatures of structure in exotic nuclei.

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[1] G. Audi, A.H. Wapstra and C. Thibault, Nucl. Phys.A729, 337 (2003).

R.B. Cakirli
Yale University, Istanbul University

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