Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

N minus Z dependence of intruder states near the island of inversion[1] SAMUEL TABOR, TRISHA HINNERS, VANDANA TRIPATHI, ALEXANDER VOLYA, Florida State University — Almost 3 decades after the discovery of deformed, intruder-dominated ground states in nuclei with Z $\sim$ 10 and N $\sim$ 20, many questions remain about the behavior of the N = 20 shell gap and how correlation effects can bridge the gap in this region of nuclei, later dubbed the "Island of Inversion," because intruder states expected to lie at higher energies actually fall below the "normal" s-d states. Recent work has illustrated how some intruder dominated states fall systematically with increasing N and decreasing Z until reaching inversion. These N and Z dependences have been treated quite differently in the most successful calculations. The fall with increasing N is generally attributed to the rising Fermi level for neutrons, while the fall with decreasing Z seems to require a reduction in the N = 20 shell gap with lowering Z, perhaps due to the tensor interaction. The recent assignment of a negative-parity intruder band in ^{30}Al at reduced energy and a subsequent survey of similar 4^- bandheads in neighboring odd-odd nuclei has led to an intriguing discovery: the excitation energy of these lowest intruder states depends only on N minus Z to an accuracy of 10 to 20 keV.

[1]Supported in part by the U.S. National Science Foundation.

Samuel Tabor
Florida State University

Date submitted: 27 May 2008 Electronic form version 1.4