APR14-2014-000181

Abstract for an Invited Paper
for the APR14 Meeting of
the American Physical Society

Quadrupole Collectivity in Neutron Deficient Sn Isotopes[1]

ALEXANDRA GADE, NSCL and Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824

One of the overarching goals of nuclear physics is the development of a comprehensive model of the atomic nucleus with predictive power across the nuclear chart. Of particular importance for the development of nuclear models is experimental data that consistently track the effect of isospin and changed binding, for example. The chain of Sn isotopes has been a formidable testing ground for nuclear models as some spectroscopic data is available from $N = Z = 50$ ^{100}Sn in the proximity of the proton dripline to ^{134}Sn, beyond the very neutron-rich doubly magic nucleus ^{132}Sn. In even-even nuclei, the electromagnetic quadrupole excitation strength is a measure of quadrupole collectivity, sensitive to the presence of shell gaps, nuclear deformation, and nucleon-nucleon correlations, for example. In the Sn isotopes, this transition strength has been reported from ^{104}Sn to ^{130}Sn, spanning a chain of 14 even-even Sn isotopes. The trend is asymmetric with respect to midshell and not even the largest-scale shell-model calculations have been able to describe the evolution of transition strength across the isotopic chain without varying effective charges. Implications will be discussed.

[1]This work was supported by the National Science Foundation under Grant No. PHY-1102511.