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Study of anomalous quadrupole collectivity in light Sn isotopes
CHRISTOPHER CAMPBELL, Lawrence Berkeley National Laboratory, NSCL EXPERIMENT E11035 COLLABORATION[1] — The chain of semi-magic Sn nuclei, with many stable isotopes, has been a fertile ground for experimental and theoretical studies. Encompassing a major neutron shell from N=50 to 82, the properties and structure of these nuclei provided important data for the development of the pairing-plus-quadrupole model. Recent experimental information on B(E2) for 106,108,110,112Sn came as a surprise as it indicated a larger collectivity than the predicted parabolic trend of quadrupole collectivity. These data, instead, show an unexpectedly flat trend even as the number of valence particles is reduced from 12 to 6. To fully understand how collectivity is evolving in these isotopes, 108,110,112Sn have been studied using thick-target, inelastic proton scattering with GRETINA tagging inelastic scattering events by detecting gamma-rays from the prompt decay of states excited in the reaction. We will present the trend of 2+ excitation cross-sections, the deduced quadrupole deformation parameters, and observations of other low-lying collective states. Comparison of these (p,p') quadrupole deformation parameters with B(E2) data will provide new insights into the relative importance of proton and neutron contributions to collectivity in these nuclei.

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