Nuclear Seminar

GIANT RESONANCES AND THE ASYMMETRY TERM IN THE NUCLEAR INCOMPRESSIBILITY

Darshana Patel, University of Notre Dame

Monday, November 5 ❖ 4:00 P.M. ❖ 124 NSH

The equation of state (EOS) of nuclear matter plays an important role in our understanding of a number of interesting phenomena such as the collective behavior of nucleons in the nuclei, the massive stellar collapse leading to a supernova explosion, nuclear properties including the neutron-skin thickness of heavy nuclei, and the radii of neutron stars. The nuclear incompressibility, K_∞, is the curvature of EOS of nuclear matter at saturation density. K_∞ is, thus, a measure of nuclear stiffness and thereby imposes significant constraints on theoretical descriptions of the effective nuclear interactions. The study of the Giant Monopole Resonance (GMR) in a series of isotopes, with changing neutron-proton asymmetry, is a direct experimental tool to investigate the role of asymmetry term in the nuclear incompressibility. Such a study on the series of $^{106\text{-}116}$Cd isotopes reveals and confirms the "softness" in this mass region. Results of this study would be presented.

Further an attempt to test the newly proposed role of Mutually Enhanced Magicity effect in the $^{204\text{-}208}$Pb isotopes, in order to describe the "softness" of $^{112\text{-}124}$Sn and $^{106\text{-}116}$Cd isotopes, would be discussed. Alongside, preparing for the future experiments to resolve the mystery, feasibility of the ^{2}H probe for the study of giant resonance would be presented.

Notre Dame Science
Department of Physics