

Nuclear Structure with Gamma ray tracking array: Isospin Symmetric Island of Inversion and perspectives for the Legnaro National Laboratories

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Protons and neutrons in nuclei are arranged in orbitals that follow a shell structure, with energy gaps at specific magic numbers. Experiments using radioactive beams have shown that these magic numbers vanish in some neutron-rich isotopes. This results in unusual arrangements, where configurations with nucleons scattered to higher energy orbitals are the most bound, forming what has been called "Islands of Inversion".

We have measured the lifetimes of 2^+ states in ^{84}Mo and ^{86}Mo isotopes, discovering a dramatic structural change. This has been understood as the boundary of a "Isospin-Symmetric Island of Inversion," where both proton and neutron excitations play an equal role and evolution of collectivity is governed by three-nucleon forces.