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Study of octupole collectivity in 146Nd and 148S

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For certain combination of protons and neutrons an appearance of reflection asymmetry is expected. In particular, the experimentally determined E3 strengths as a function of the neutron number are peaked around N˜88 and N˜134. Many theoretical approaches have been applied to describe the regions of enhanced octupole collectivity and its experimental signatures, such as parity doublets in odd-mass nuclei, and low-lying opposite-parity bands and high E3 transition probabilities in even-even nuclei.

Low-energy Coulomb excitation is a highly successful method for establishing the evolution of nuclear shapes via measurements of cross sections to populate excited states that can be directly related to the static and dynamic moments of the charge distribution of the nucleus.

The octupole correlations in the ^{146}Nd (N=86, Z=60) and ^{148}Sm (N=86, Z=62) nuclei were investigated in a Coulomb excitation experiment with stable ^{58}Ni and ^{32}S beams. The experiment was part of the MINORCA Campaign (MINIBALL spectrometer coupled with ORGAM Array) at IPN Orsay.

We present the status of data analysis from this experiment with a particular focus on the $<3^{-}||E3||\ 0^{+}>$ and $<1^{-}||E3||\ 4^{+}>$ matrix elements that are expected to provide a distinction between an octupole vibration and a rigid deformation.

Author: KOMOROWSKA, Michalina (Heavy Ion Laboratory University of Warsaw)

Co-authors: NAPIORKOWSKI, Paweł (Haevy Ion Laboratory University of Warsaw); ZIELIŃSKA, Magda (CEA Saclay); PRÓCHNIAK, Leszek (Heavy Ion Laboratory); KORTEN, Wolfram (CEA Saclay)

Presenter: KOMOROWSKA, Michalina (Heavy Ion Laboratory University of Warsaw)

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