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Mirror energy differences and the J=2 anomaly

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Mirror energy differences and the J=2 anomalyThe study of differences in excitation energy between analogue states in isobaric multiplets allows to verify the validity of isospin symmetry and independence as a function of the angular momentum. These differences are of the order of tens of keV and can be well reproduced by state-of-the-art shell model calculations. Several nuclear structure properties can be deduced from these data, such as the alignment of nucleons along rotational bands, the evolution of the nuclear radius and the identification of pure single particle excitations across two main shells. In addition, the isospin breaking of the nuclear interaction is suggested by the systematic comparison with data. The different ingredients that enter the calculation of the Coulomb energy differences between mirror nuclei are discussed in comparison with the experimental data of nuclei in the f7/2 and in the sd shell.

Primary author: Prof. LENZI, Silvia Monica (University and INFN Padova)

Presenter: Prof. LENZI, Silvia Monica (University and INFN Padova)

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