ID de Contribution: **58** Type: **Non spécifié**

Nuclei at the mirror: study of energy differences between analogue excited states

lundi 8 octobre 2012 14:00 (40 minutes)

The study of isospin symmetry in nuclei as a function of angular momentum is a very powerful tool to understand nuclear
properties in rotating nuclei. These studies have become feasible in the last decade due to recent experimental developments in the identification of proton-rich nuclei produced with very low cross sections. Contemporaneously,
state-of-the-art shell-model codes have been produced for the description of these data. The synergy between theory and
experiment for the study of energy differences of mirror and isobaric analogue nuclei in the mass region between A ~ 30
and A ~ 70 allows the investigation of the evolution of the nuclear wave functions with increasing spin. The alignment
process, changes of the nuclear shape and the intrinsic configuration, together with the evidence of
isospin-non-conserving terms of the nuclear interaction are examples of the type of phenomena that can be studied from
the analysis of Coulomb energy differences.
A review of the different results on what we can learn from mirror energy differences will be given, together with an
outlook on current and future developments.

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Classification de Session: Nuclear structure at the proton dripline

Classification de thématique: Nuclear structure at the proton dripline