



Contribution ID: 336

Type: **not specified**

Isospin-symmetry breaking in nuclear structure

Wednesday, 5 September 2018 09:30 (30 minutes)

The isospin symmetry is a useful symmetry in nuclear physics, which provides important guidelines for the construction of the nucleon-nucleon interaction and can largely simplify the formalism of some nuclear structure models. However, it is an approximate symmetry, broken due to the up and down quark mass difference and electromagnetic interactions between the quarks. Experimental studies of proton-rich nuclei and precision measurements call for an accurate theoretical description of isospin-symmetry breaking effects.

The talk will focus on recent achievements in the construction of precise isospin-nonconserving Hamiltonians mainly in the framework of the nuclear shell model. Phenomenological approaches will be compared with the first charge-dependent microscopic effective interactions.

We will review recent applications to the structure and decay of nuclei near $N=Z$ line and proton-rich nuclei.

Then, we will show the importance of charge-dependent theoretical description of nuclear states for the tests of the fundamental symmetries in nuclear weak decays (such as superallowed Fermi beta decay), as well as we will underline its relevance for some astrophysically important reaction rates.

Presenter: Dr SMIRNOVA, Nadezda (Centre d'Etudes Nucléaires de Bordeaux-Gradignan)

Session Classification: Plenary