Université Paris-Saclay
IJCLab
(Laboratoire de Physique des 2 Infinis Irène Joliot-Curie)
Bât. 100, F-91405 Orsay

Séminaire de Physique Nucléaire Théorique

Spin-isospin resonances with the new functionals : SAMi, SAMi-ISB and SAMi-T.

X. Roca-Maza

(Università degli Studi di Milano and INFN, Via Celoria 16, 20133 Milano, Italy.)

In this seminar, I will review some recent developments of the Milano group in the study of spin-isospin resonances with Skyrme functionals. In the past, different attempts to build a functional that can describe nuclear masses, charge radii and excitation energies of non-charge exchange and charge exchange resonances at the same time have been performed [1-4]. On this regard, we have proposed in Ref. [5] a new functional named SAMi based on a fitting protocol that allows for a better description of spin-isospin resonances without compromising the accuracy in the description of other observables. Subsequently, in Ref. [6] we have further improved the SAMi functional by including tensor terms. For that, we have kept the same fitting protocol of SAMi but including also information from ab initio calculations on neutron and neutron-proton drops to determine the tensor terms. The new functional has been named SAMi-T. In parallel to the latter work, we have also improved the SAMi functional in the description of the Isobaric Analog State (IAS), a pure isospin resonance. Such improvement has been achieved by the inclusion of isospin symmetry breaking terms to the functional [7]. The new interaction is named SAMi-ISB. In this case, the SAMi fitting protocol has been extended to also include information on ab initio results of ISB corrections to the symmetric matter equation of state and of the IAS in ^{208}Pb.

[1] N. Giai and H. Sagawa, Phys. Lett. B 106, 379 (1981).
[2] P.-G. Reinhard, D. J. Dean, W. Nazarewicz, J. Dobaczewski, J. A. Maruhn, and M. R. Strayer, Phys. Rev. C 60, 014316 (1999).
[3] N. Paar, T. Niksic, D. Vretenar, and P. Ring, Phys. Rev. C 69, 054303 (2004).
[4] H. Liang, N. Van Giai, and J. Meng, Phys. Rev. Lett. 101, 122502 (2008).
[5] X. Roca-Maza, G. Colò and H. Sagawa, Phys.Rev. C 86, 031306 (2012).
[6] Shihang Shen, G. Colò and X. Roca-Maza, arXiv :1810.09691 (2018) (Submitted to PRC)
[7] X. Roca-Maza, G. Colò, and H. Sagawa, Phys. Rev. Lett. 120, 202501 (2018)

Mercredi 28 Novembre 2018
11 :30
IJCLab, Bât. 100, Salle Bâtiment 100, Salle A015