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The nuclear symmetry energy and the breaking of the isospin symmetry: how do they reconcile with each other?

In this contribution, we will analyze and propose a solution to the apparent inconsistency between our current knowledge of the Equation of State of asymmetric nuclear matter, the energy of the Isobaric Analog State (IAS) in a heavy nucleus such as ^{208}Pb , and the isospin symmetry breaking forces in the nuclear medium. This is achieved by performing state-of-the-art Hartree-Fock plus Random Phase Approximation calculations of the IAS that include all isospin symmetry breaking contributions. To this aim, we propose a new effective interaction that is successful in reproducing the IAS excitation energy without compromising other properties of finite nuclei [1].

[1] X. Roca-Maza, G. Colò, and H. Sagawa. Nuclear symmetry energy and the breaking of the isospin symmetry: How do they reconcile with each other? *Phys. Rev. Lett.* (accepted), 2018.

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