

Service de Physique Nucléaire



Séminaire

le vendredi 14 novembre 2014 à 11h00

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

Ab initio calculation of the neutron-proton mass difference

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The existence and stability of atoms relies on the fact that neutrons are more massive than protons. The mass difference is only 0.14% of the average and has significant astrophysical and cosmological implications. A slightly smaller or larger value would have led to a dramatically different universe. After an introduction to the problem and to lattice quantum chromodynamics (QCD), I will show how this difference can be computed precisely by carefully accounting for electromagnetic and mass isospin breaking effects in lattice computations. I will also report on results for splittings in the Σ , Ξ , D and Ξ_{cc} isospin multiplets, some of which are predictions. The computations are performed in lattice QCD plus QED with four, non-degenerate quark flavors.

Le café sera servi 10 minutes avant

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