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Séminaire de Physique Nucléaire Théorique

Pion-full Effective Field Theory in Nuclear Physics with Quantum Monte Carlo methods

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Effective field Theory (EFT) has become the standard protocol in the treatment of the nucleon-nucleon interaction. In this talk I will show some recent progress that we have made in a direction that slightly differs from the standard use of chiral-EFT to produce potentials employed in few- or many- body calculations. Starting from the EFT Lagrangian, and passing through the Schroedinger representation, it is possible to reshape the theory in terms of non-relativistic nucleons coupled to relativistic dynamical pions that occupy momentum-labelled modes in a finite periodic box. We then managed to set up an efficient Quantum Monte Carlo framework to make use of this formulation[1]. Some results on the properties of a single nucleon and of the deuteron will be shown.

[1] Lucas Madera, Alessandro Lovato, FP, Kevin E. Schmidt, arXiv :1803.10725

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