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Séminaire de Physique Nucléaire Théorique

Application of dimentionality reduction techniques to reduce the complexity of many-body formalisms

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The resolution of the (nuclear) many-body Schroedinger equation typically involves the use of large tensors that present both storage and computational challenges. This statement is particularily true when going beyond mid-mass nuclei and / or designing symmetry breaking expansion methods to tackel open-shell nuclei. One possibility to reduce the storage cost is to design factorized formats of the tensors encoding the nuclear interaction but this usually requires to adapt the many-body framework in order to gain something out of it. In this presentation, an alternative route is explored by directly factorising many-body tensors arising beyond the mean-field and show applications based on ab initio chiral interactions by computing second-order perturbation theory correlation energy in systems that can simultaneously break all symmetries in realistic model spaces.

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