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Order-by-order convergence of chiral nuclear forces in neutron matter (online)

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Modern formulations of nuclear forces, such as pionless or chiral effective field theory, are typically based on a perturbative approach. Such interactions are then often employed by state-of-the-art nuclear many-body techniques (such as quantum Monte Carlo) which are non-perturbative in nature. The equation of state of a compact star is thus the result of this interplay of perturbative nuclear force and non-perturbative many-body method. Despite the centrality of this question to nuclear *ab initio* predictions, the perturbative use of nuclear interactions as input is still in its infancy (i.e., limited to first order). In this talk I will report on our recent work fusing non-perturbative approaches and second-order perturbation theory. Results will build up to the order-by-order convergence of chiral Effective Field Theory interactions for pure neutron matter.

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