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Nuclear response functions with quantum (inspired) algorithms

Content

The ab-initio determination of the nuclear response to small perturbation is of fundamental importance to predict transport properties of neutron star matter and cross sections for electro-weak processes in neutron stars. The direct calculation of dynamical properties however poses serious challenges to traditional many-body methods. In this talk I will discuss how quantum computing could help in solving these problems and present some of the quantum algorithms that have been proposed to calculate nuclear responses. A variant of these schemes can actually be adapted to classical Coupled-Cluster methods and I will present recent results for the spin response of neutron matter obtained in this way.

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