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Variational learning quantum wave functions

Wednesday, 10 July 2024 14:15 (25 minutes)

Solving the quantum many-body problem involves non-trivial challenges arising from the exponential growth of the Hilbert space dimension, which restricts the applicability of numerically exact techniques to relatively small systems. I will discuss how variational Monte Carlo methods, based on artificial neural networks, can provide a systematically improvable solution to the quantum many-body problem with a polynomial cost in the number of interacting particles. My focus will be on nuclear systems, including finite nuclei and neutron-star matter, but I will also present applications to condensed-matter systems, such as cold Fermi gases near the unitary limit. Finally, I will provide perspectives on accessing the real-time dynamics of quantum many-body systems.

session

I. Nuclear Structure and Reactions

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