

Abstract Submitted
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Incorporating exact two-body propagators for zero-range interactions into N -body Monte Carlo simulations¹ YANGQIAN YAN, D. BLUME, Washington State University — Ultracold atomic gases are, to a very good approximation, described by pairwise zero-range interactions. This work demonstrates that N -body systems with two-body zero-range interactions can be treated reliably and efficiently by the finite temperature and ground state path integral Monte Carlo approaches, using the exact two-body propagator for zero-range interactions in the pair product approximation. The performance of the propagators is tested by reproducing known results for various one- and three-dimensional systems. We further calculate the energy and structural properties for the ground state of N three-dimensional bosons at unitary interacting via two-body zero-range and three-body repulsive potentials.

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Yangqian Yan
Washington State University

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