

Quantum Monte Carlo study of a Fermi gas in the BCS-BEC crossover

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By using the fixed-node diffusion Monte Carlo method we investigate the ground state properties of an interacting Fermi gas in the BCS-BEC crossover. We report results for the equation of state and for the one- and two-body correlation functions. In particular, off-diagonal long-range order in the system is investigated through the asymptotic behavior of the two-body density matrix. The condensate fraction of fermionic pairs is calculated in the unitary limit and on both sides of the BCS-BEC crossover.