

Abstract Submitted
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Quasiclassical molecular dynamics for the dilute Fermi gas at unitarity KEVIN DUSLING, American Physical Society APS, THOMAS SCHAFER, North Carolina State University — We study the dilute Fermi gas at unitarity using molecular dynamics with an effective quantum potential constructed to reproduce the quantum two-body density matrix at unitarity. Results for the equation of state, the pair correlation function and the shear viscosity are presented. These quantities are well understood in the dilute, high temperature, limit. Using molecular dynamics we determine higher order corrections in the diluteness parameter $n\lambda^3$, where n is the density and λ is the thermal de Broglie wave length. In the case of the contact density, which parameterizes the short distance behavior of the correlation function, we find that the results of molecular dynamics interpolates between the truncated second and third order virial expansion, and are in excellent agreement with existing T-matrix calculations. For the shear viscosity we reproduce the expected scaling behavior at high temperature, $\eta \sim 1/\lambda^3$, and we determine the leading density dependent correction to this result.

Kevin Dusling
American Physical Society APS

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