Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Trapped unitary two-component Fermi gases with up to ten particles[1] X.Y. YIN, D. BLUME, Washington State University — The properties of two-component Fermi gases with zero-range interactions are universal. We use an explicitly correlated Gaussian basis set expansion approach to investigate small equal-mass two-component Fermi gases under spherically symmetric external harmonic confinement. At unitarity, we determine the ground state energy for systems with up to ten particles interacting through finite-range two-body potentials for both even and odd number of particles. We extrapolate the energies to the zero-range limit using a novel scheme that removes the linear and quadratic dependence of the ground state energies on the two-body range. Our extrapolated zero-range energies are compared with results from the literature. We also calculate structural properties and the two-body Tan contact.

[1]We acknowledge support by the NSF through Grant No. PHY-1205443. This work used the XSEDE, which is supported by NSF Grant No. ACI-1053575.

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Date submitted: 29 Jan 2015 Electronic form version 1.4