Energy spectra of small two-component Fermi gases in a cubic box with periodic boundary conditions[1] X.Y. YIN, Washington State University, D. BLUME, Washington State University and ITAMP — The properties of two-component Fermi gases become universal if the interspecies s-wave scattering length and the average interparticle spacing are much larger than the range of the underlying two-body potential. Using an explicitly correlated Gaussian basis set expansion approach, we determine the eigenenergies of two-component Fermi gases in a cubic box with periodic boundary conditions as functions of the interspecies s-wave scattering length and the effective range of the two-body potential. The universal properties of systems consisting of up to five particles are determined by extrapolating the finite-range energies to the zero-range limit. We determine the eigenenergies of states with vanishing and finite momentum. For the infinitely large scattering length case, we compare our results with those presented in the literature.

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