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Correlation energy of a homogeneous dipolar Fermi gas[1] BO LIU, LAN YIN, School of Physics, Peking University, Beijing 100871, China — We study the normal state of a 3-D homogeneous dipolar Fermi gas beyond the Hartree-Fock approximation. The correlation energy is found of the same order as the Fock energy, unusually strong for a Fermi-liquid system. As a result, the critical density of mechanical collapse is smaller than that in the Hartree-Fock approximation. An new energy functional including the correlation energy is constructed to describe inhomogeneous cases, and its properties are explored.

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