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The Hartree-Fock ground state of high-density jellium[1] SHIWEI ZHANG, College of William and Mary, DAVID CEPERLEY, University of Illinois at Urbana-Champaign — The usual textbook paramagnetic solution is not the Hartree-Fock (HF) ground state of the uniform electron gas (jellium). Overhauser[2] showed that, for example, a spin-density-wave state would have lower energy, even at the high density limit. We obtain numerically the unrestricted Hartree-Fock (uHF) ground state of 3-D jellium, using a projection technique starting from random initial states. Supercells with around 1000 electrons are studied, with a range of r_s values at high densities. We study the energetics of the uHF ground state, and discuss its real- and **k**-space structures.

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[2]A. W. Overhauser, Phys. Rev. 128, 1437 (1962).

Shiwei Zhang
College of William and Mary

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