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**Equation of state and magnetic properties of the three-dimensional repulsive Hubbard model**[1] CHIA-CHEN CHANG, SHIWEI ZHANG, Department of Physics, The College of William and Mary — Motivated by recent advances in fermionic optical-lattice experiments, we report results from numerical simulations of the ground state properties of the three-dimensional single-band Hubbard model (with nearest-neighbor hopping and repulsive $s$-save onsite interaction). We focus on intermediate interaction strengths, $U/t <\sim 10$. The constrained-path auxiliary-field quantum Monte Carlo method is used, with a phaseless approximation to control the sign/phase problem. One-body finite size effects and shell effects are eliminated by implementing twist-averaged boundary conditions. The equation of state is determined accurately for several values of $U/t$. We study the nature of the ground state away from half-filling by examining the spin-spin and other correlation functions as a function of doping.

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