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Exploration of pseudogap scenarios in the three-orbital Hubbard model of cuprate superconductors Y.F. KUNG, SIMES, SLAC National Accelerator Laboratory, and Stanford University, C.-C. CHEN, APS, Argonne National Laboratory, E.A. NOWADNICK, Columbia University, S. JOHNSTON, University of British Columbia, B. MORITZ, SIMES, SLAC National Accelerator Laboratory, T.P. DEVEREAUX, SIMES, SLAC National Accelerator Laboratory, and Stanford University — One intriguing question in cuprate high-temperature superconductors concerns the nature of the pseudogap, whose origin remains elusive despite intense effort in both theory and experiment. Various ordered states have been proposed, yet with conflicting results from different numerical studies. Here we use determinant quantum Monte Carlo (DQMC) simulations to investigate the possibility of orbital loop currents, d-density waves, and oxygen antiferromagnetism in the three-orbital Hubbard model. We explore the dependence of their correlation functions on temperature and doping, as well as their relative magnitudes, to shed light on how these orders depend on the parameters of the model Hamiltonian. The DQMC calculations are further compared to results from exact diagonalization.

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