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Searching for stripe order in the Hubbard model EDWIN HUANG, CHRISTIAN MENDL, HONGCHEN JIANG, SHENXIU LIU, YVONNE KUNG, SLAC National Accelerator Laboratory and Stanford University, BRIAN MORITZ, SLAC National Accelerator Laboratory, STEVEN JOHNSTON, University of Tennessee, Knoxville, THOMAS DEVEREAUX, SLAC National Accelerator Laboratory and Stanford University — The existence of stripe ordering in doped cuprates is well-established experimentally, but the microscopic mechanisms of their formation and their relation to superconductivity remain open questions. Previous density-matrix renormalization group (DMRG) studies on t-J and Hubbard ladders, in the parameter regimes relevant to cuprates, have suggested the presence of charge and spin stripes in the ground states of these microscopic models. To further investigate these tendencies towards stripe formation, we perform determinant quantum Monte Carlo (DQMC) and DMRG simulations for the single-band and three-band Hubbard models on identical rectangular lattice geometries. For both methods, upon hole doping, we find the spontaneous formation of domain walls in the spin correlation function, characterized by a pi-phase shift of the antiferromagnetic ordering upon traversing a domain wall. We compare and contrast the results from the single-band and three-band Hubbard models using both techniques.

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