Fluctuating Stripes in 3-Band Hubbard models from DMRG and DQMC simulations

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Upon doping, Mott insulators often exhibit translational symmetry breaking where charge carriers and their spins organize into patterns known as stripes. For high-T_C superconducting cuprates, a widely suspected notion has been that stripes exist in a fluctuating form. Here, we use numerically exact determinant quantum Monte Carlo (DQMC) and density matrix renormalization group (DMRG) calculations to demonstrate strong dynamical stripe correlations in the three-band Hubbard model, which represents the local electronic structure of a Cu-O plane in a cuprate superconductor. Our results, which are surprisingly robust to parameters, cluster size, and boundary conditions, strongly support the interpretation of a variety of experimental observations in terms of the physics of fluctuating stripes, including the hourglass magnetic dispersion and the Yamada plot of incommensurability vs. doping. These findings provide a novel perspective on the multitude of intertwined orders emerging out of the cuprates' normal state.