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Spin and Charge Order in The Emery Model for the Cuprates: the Underdoped Regime ETTORE VITALI, California State University, Fresno, ADAM CHICIAK[1], College of William and Mary, SHIWEI ZHANG, Center for Computational Quantum Physics (CCQ) Flatiron Institute — The Emery model, or three-band Hubbard model, is a minimal model for the Copper-Oxygen planes in the Cuprates, high temperature superconductors. We use state-of-the art Quantum Monte Carlo calculations to study the ground state of the model in the under-doped regime. We study large supercells containing up to 500 atoms in order to capture long range collective modes in the charge and spin order and we characterize the behavior in the thermodynamic limit. We present information on the charge order, magnetic order, momentum distribution, and localization properties as a function of charge-transfer energy for the the under-doped regime. In contrast with the stripe and spiral orders under hole-doping, we find that the corresponding 1/8 electron-doped system exhibits purely antiferromagnetic order in the three-band model, consistent with the asymmetry between electron-and hole-doping in the phase diagram of Cuprates.

[1]Dr. Chiciak just graduated from College William and Mary

Ettore Vitali
California State University, Fresno

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