Abstract Submitted
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Quantum Monte Carlo study of antiferromagnetic correlations in the Positive U Fermi-Hubbard model[1] THEREZA PAIVA, Instituto de Fisica, Universidade Federal do Rio de Janeiro, RUSSELL HART, PEDRO DUARTE, ERNIE YANG, XINXING LIU, RANDY HULET, Physics Department, Rice University, DAVID HUSE, Physics Department, Princeton University, RICHARD SCALETTAR, Physics Department, University of California, Davis, NANDINI TRIVEDI, Physics Department, Ohio State University — We use determinantal quantum Monte Carlo (QMC) simulations[1,2] to investigate the fermion Hubbard model as a function of filling, temperature and population imbalance. We find that (i) the structure factor is not very sensitive to population imbalance for the ranges of temperatures currently available in the experiments; (ii) at half filling for a large range of U the antiferromagnetic structure factor collapses onto a universal curve. This scaling behavior along with QMC data for other scattering angles allows us to directly compare with experimental Bragg scattering data and put constraints on the experimental Neel ordering temperature. [1] "Fermions in 2D Optical Lattices: Constraints on entropy for observing antiferromagnetism and superfluidity", T. Paiva, R.T. Scalettar, M. Randeria, and N. Trivedi, Phys. Rev. Lett. 104, 066406 (2010). [2] "Fermions in 3D Optical Lattices: Cooling Protocol to Obtain Antiferromagnetism", T. Paiva, Yen Lee Loh, N. Trivedi, M. Randeria and R.T. Scalettar, Phys. Rev. Lett. 107, 086401 (2011)

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