Abstract Submitted
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Density of States and Magnetic Correlations at a Metal-Mott Insulator Interface[1] MI JIANG, Physics Department, University of California, Davis, California 95616, USA, GEORGE BATROUNI, INLN, Université de Nice-Sophia Antipolis, CNRS; 1361 route des Lucioles, 06560 Valbonne, France, RICHARD SCALETTAR, Physics Department, University of California, Davis, California 95616, USA — The possibility of novel behavior at interfaces between strongly and weakly correlated materials has come under increased study recently. In this paper, we use determinant Quantum Monte Carlo to determine the interpenetration of metallic and Mott insulator physics across an interface in the two dimensional Hubbard Hamiltonian. We quantify the behavior of the density of states at the Fermi level and the short and long range antiferromagnetism as functions of the distance from the interface and with different interaction strength, temperature and hopping across the interface. Induced metallic behavior into the insulator is evident over several lattice spacings, whereas antiferromagnetic correlations remain small on the metallic side. At large interface hopping, singlets form between the two boundary layers, shielding the two systems from each other.

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