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Quantum Monte Carlo Study of an Interaction-Driven Band Insulator to Metal Transition¹ NORMAN PARIS, University of California, Davis, KARIM BOUADIM, FREDERIC HEBERT, GEORGE BATROUNI, Institut Non-Linéaire de Nice, UMR 6618 CNRS, Université de Nice–Sophia Antipolis, RICHARD SCALETTAR, University of California, Davis — We study the transitions from band insulator to metal to Mott insulator in the ionic Hubbard model on a two dimensional square lattice using determinant Quantum Monte Carlo. Evaluation of the temperature dependence of the conductivity demonstrates that the metallic region extends for a finite range of interaction values. The Mott phase at strong coupling is accompanied by antiferromagnetic (AF) order. Inclusion of these intersite correlations changes the phase diagram qualitatively compared to dynamical mean field theory.

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