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Influence of non-local interactions on the Mott metal-insulator transition. M. SCHUELER, Universtity of Bremen, Institute for Theoretical Physics, E. G. C. P. VAN LOON, M. I. KATSNELSON, Radboud University, Institute for Molecules and Materials, T. O. WEHLING, Universtity of Bremen, Institute for Theoretical Physics — We investigate how short- and long-ranged non-local Coulomb interactions influence the metal-insulator phase boundary of the half-filled Hubbard model on square lattices and honeycomb lattices. We find that generally, non-local interactions stabilize the Fermi-liquid regime and that the phase boundary behaves linearly with infinitesimal non-local interactions. We present an upper bound for the boundary's slope. For our investigations, we use a variational principle which maps extended Hubbard models to effective purely local Hubbard models. The mapping relies on Quantum Monte Carlo solutions of the the local Hubbard model.

Malte Schueler
Universtity of Bremen

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