Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Effect of non-local interactions and correlations in two-dimensional extended Hubbard model HANNA TERLETSKA, University of Michigan, TIANRAN CHEN, West Chester University of Pennsylvania, EMANUEL GULL, University of Michigan — We study the half-filled extended Hubbard model in two dimensions using the dynamical cluster approximation on clusters large enough that finite size effects can be controlled. The model exhibits the metallic, Mott insulating and charge ordered phases under the change of control parameters (temperature T, neighbor interaction V, and local onsite interaction U). The charge ordered phase is characterized by a checkerboard arrangement of electrons with non-zero staggered density. Our results show that within the ordered phase the model exhibits vanishing scattering rate and a finite real part of the self-energy, indicating the band-insulating-like behavior. We also find that charge ordering can be suppressed by temperature and local on-site interaction, with the critical temperature depending strongly on both local U and non-local interaction V strength. We find noticeable non-local correlations and pronounced screening effects especially in the vicinity of the transition, and explore the nature of non-local interactions on screening in detail.

Hanna Terletska
University of Michigan

Date submitted: 07 Nov 2016 Electronic form version 1.4