Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Disordered Supersolids in the Extended Bose-Hubbard Model[1]

VITO SCAROLA, BHARGAV KEMBURI, Virginia Tech — Studies of the extended Bose-Hubbard model seek to capture the essential properties of a wide variety of physical systems including helium, Josephson junction arrays, certain narrow-band superconductors, and bosons in optical lattices. We theoretically study the stability of lattice supersolid states in the extended Bose-Hubbard model with bounded spatial disorder. We construct a disorder mean field theory and compare with quantum Monte Carlo calculations. We find that the supersolid survives weak disorder on the simple cubic lattice. We also find that increasing disorder strength can transform a lattice solid into a supersolid as it tends to percolate through the disorder landscape.

Vito Scarola
Virginia Tech

Date submitted: 10 Nov 2011   Electronic form version 1.4