

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Supersolid vs. phase separation in 2D PINAKI SENGUPTA,
LEONID P. PRYADKO, UC Riverside, FABIEN ALET, CEA Saclay, MATTHIAS
TROYER, ETH Zürich, GUIDO SCHMID, ETH Zürich — We study the nature of
the ground state of the strongly-coupled two dimensional extended Bose Hubbard
model on a square lattice. Strong coupling expansion and quantum Monte Carlo
simulation of finite systems were used to analyse the stability of the (π, π) crystalline
order at half-filling and the effects of doping away from it. We find that strong but
finite on-site interaction along with a comparable nearest-neighbor repulsion results
in a thermodynamically stable supersolid ground state just above half-filling, while
the system phase separates just below half-filling. The interplay between these two
interaction energies results in a rich phase diagram which is studied in detail.

Pinaki Sengupta
UC Riverside

Date submitted: 01 Dec 2004

Electronic form version 1.4