SFB/TRR 21 - Seminar
13. Juli 2011, Stuttgart

Subhasis Sinha
(Indian Institute of Science Education and Research, Kolkata, India)

Superfluid-Mott insulator transition in the presence of an artificial magnetic field.

Superfluid(SF)-Mott insulator(MI) transition of ultracold bosons in an optical lattice has opened up new direction in many-body physics. We study SF-MI transition of ultracold bosonic atoms in a two-dimensional square optical lattice in the presence of a synthetic magnetic field with p/q flux quanta passing through each lattice plaquette. On approach to the transition from the Mott side, the momentum distribution of the bosons exhibits q precursor peaks.
We also provide an effective theory for the transition which involves q interacting boson fields. For *q=2,3* both gapless and gapped collectives are computed.

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Universität Stuttgart, NWZII, Raum 5.331
Pfaffenwaldring 57, 70569 Stuttgart

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