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THE MOTT INSULATING PHASE OF THE BOSE-HUBBARD MODEL

The Bose-Hubbard model was introduced by Matthew Fisher et.al. in 1989 as a simple lattice model displaying a transition from a Mott insulator to a Bose-Einstein condensate. This model got renewed interest because of the recent experiments with bosonic atoms in optical lattices. I will review some mathematical results such as the proof for the occurrence of off-diagonal long-range order using reflection positivity (in the hard-core model). I will also explain perturbation methods describing the Mott insulator.