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Title:
Hard-core bosons in two-dimensional lattice models with competing interactions

We use Monte-Carlo simulations to analyse phase diagrams of bosonic lattice models with competing interactions. These bosonic models map onto frustrated spin-1/2 Heisenberg models with an xxz-anisotropy. The frustration causes a large ground-state degeneracy for a certain set of parameters. In the vicinity of this critical point new quantum phases are expected. We calculate order parameters for classical ordered phases and for quantum phases like superfluidity or dimer ordering. We determine transition temperatures and show phase diagrams for finite temperatures and for the ground-state. We find the classical ordered phases to be suppressed in the highly frustrated region and find a superfluid phase for large quantum fluctuations.