

Abstract Submitted
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Tuning the disorder in a bosonic superglass¹ DEREK LARSON, YING-JER KAO, National Taiwan University — We study the phase transitions associated with tuning the disorder in a Bose-Hubbard model exhibiting a superglass phase. By shifting the distribution of a nearest neighbor $\pm J$ interaction between hard-core bosons on a three-dimensional lattice, we can produce anti-ferromagnetic, glassy, and ferromagnetic (diagonal) types of ordering, each of which interacts uniquely with the superfluid (off-diagonal) ordering. Quantum Monte Carlo simulation results using the worm algorithm show that the existence of superfluidity guards against the formation of large ferromagnetic clusters, presumably due to a lowering of the cost of interfaces. This leads to a strongly-temperature-dependent phase boundary between the glassy and ferromagnetic regions.

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