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Theory of magnetic Bose glass in Br-doped dichloro-tetrakis-thiourea-nickel (DTN)[1] STEPHAN HAAS, University of Southern California, RONG YU, Rice University, TOMMASO ROSCILDE, Ecole Normale Supérieure de Lyon - France — We will review here the microscopic model allowing to describe quantitatively the physics of Br-doped DTN. The magnetic Hamiltonian of Br-DTN describes S=1 spins coupled through bimodally distributed antiferromagnetic bonds, and with a correlated bimodal distribution of single-ion anisotropies. A spin-boson mapping leads to a description in terms of a Bose-Hubbard-like model with random hoppings and random on-site interactions for magnetic quasiparticles, whose density is controlled by the applied magnetic field. This model features an extended gapless and compressible Bose-glass phase in low fields, extending down to zero field, at which the compressibility vanishes, corresponding to a Mott-glass phase. We will present extensive quantum Monte Carlo results for the thermodynamic signatures of the Bose glass, and for the quantum critical signatures of the magnetic ordering transition occurring at stronger field, which corresponds to a remarkable realization of the Bose-glass/superfluid transition.

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