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**Spin Glass Phase in the Disordered Spin Systems** NVSEN MA, DAO-XIN YAO, Sun Yat-Sen University, ANDERS SANDVIK, Boston University — We use quantum Monte Carlo simulations to study a glassy ground state of S = 1/2 quantum spins by using a dimerized J1-J2-J3 Heisenberg model on the square lattice. J1 corresponds to weak bonds, and J2 and J3 are stronger bonds which are randomly distributed on columnar rungs forming coupled 2-leg ladders. By tuning the average value of J2 and J3, the system undergoes Neel glass paramagnetic quantum phase transition. The size of the glass region is affected by the value of the disorder strength. In the glass phase, we find that the uniform susceptibility decreases with T according to $exp(1/T^a)$ with $a < 1$; thus the state is incompressible at $T = 0$ and classified as a Mott glass (MG). At the Neel-MG transition, the susceptibility behaves as $T^{2/z-1}$, where z is the dynamical exponent and it is close to 1.

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