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What is a dynamical glass transition? CLAUDIO CHAMON, Boston University, CLAUDIO CASTELNOVO, DAVID SHERRINGTON, University of Oxford — Using the mapping between the Fokker-Planck description of classical stochastic dynamics into a quantum Hamiltonian, we argue that a dynamical glass transition must have a precise definition in terms of a quantum phase transition. At the static level, the transition affects the ground state wavefunction: while in some cases it could be picked up by the expectation value of a local operator, in others the order may be non-local, and impossible to be determined with any local probe. In general, even in the absence of a local order parameter, the transition can be detected via the quantum fidelity of the groundstate wavefunction, which we show translates directly into a singularity in the heat capacity of the classical system. We illustrate these ideas using exact diagonalizations of the mapped Hamiltonians for the p-spin models and the gonihedric model.

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