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Spatial structures and dynamics of kinetically constrained models of glasses

GIULIO BIROLI, SPhT CEA

In glass-formers and more general jamming systems the microscopic motion is highly constrained because of the interaction with the surrounding particles. An example is the cage effect in glass-forming liquids. Kinetically constrained models encode this in a simple way. They are lattice models in which particles evolve by a stochastic dynamics with kinetic constraints: particles cannot move if surrounded by too many others. We shall show that from these simple dynamical rules highly non trivial physical phenomena emerge as super-Arrhenius behavior, dynamical heterogeneity and finite dimensional glass-jamming transitions.