Relation between structure of blocked clusters and relaxation dynamics in kinetically constrained models EIAL TEOMY, YAIR SHOKEF, Tel Aviv University — In a liquid all the particles are mobile, while in a glass only some of them are mobile at any given time. Although overall the structure is amorphous in both cases, the difference is that in glasses there are local structures that inhibit the movement of particles inside them. We investigate the size of these structures by considering the minimum number of particles that need to move before a specific particle can move. In kinetically-constrained models this structural property, the mean culling time, is easy to find by iteratively culling mobile particles from a snapshot of the system. We use the Kob-Andersen, Fredrickson-Andersen, and the spiral models, which are either lattice gases in which a particle may hop to a nearby site if its local environment satisfies some constraint, or Ising-like models in which a spin, representing regions of high and low mobility, can flip if its environment satisfies some constraint. We compare these structural properties to the dynamics in these models by measuring the persistence time, which is the average time it takes a particle to move for the first time. We find an algebraic relation between the mean culling time and the persistence time, with a model-dependent exponent.

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