

Abstract Submitted
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Comparing Record Dynamics Predictions with Simulations and Experiments of Aging Colloids¹ STEFAN BOETTCHER, Physics Department, Emory University, NIKOLAJ BECKER, PAOLO SIBANI, Institut for Fysik Kemi og Farmaci, South Danish University — We describe the spontaneous off-equilibrium relaxation process known as aging in a simple, real-space model: Kinetic constraints bind on-lattice particles together in “clusters,” where a phenomenological function of size controls their lifetime. But once a cluster breaks down, its particles can move independently in space, a process akin to “cage breaking,” to join other clusters.² Known properties of glassy systems *emerge*, such as spatial heterogeneity and record dynamics. Here we compare our simple model with recent molecular dynamics studies of hard-sphere colloids.³ We find agreement with the scaling properties of the particles mean square displacement, and the aging properties of the interface energy, of the intermediate scattering function, and of the probability density function of the particle displacements occurring within different time windows. These properties are related to an underlying Poisson process which describes the salient events or quakes which correspond to the break up of clusters and give a coarse-grained description of the model dynamics, confirmed by re-analysis of experimental data.

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²S. Boettcher and P. Sibani, JPCM, **23**, 065103 (2011);

³D. El Masri, L. Berthier, and L. Cipelletti, PRE, **82**, 031503 (2010).

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