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Using s-ensemble to probe glasses formed by cooling and aging DAVID CHANDLER, University of California, Berkeley, JUAN P. GARRAHAN, University of Nottingham, AARON S. KEYS, University of California, Berkeley — Space-time phase transitions can be studied within the context of large-deviation formalism. Numerical implementations of this formalism to lattice models and atomistic models have demonstrated the existence of such transitions between liquid-like (i.e., dynamically active) and glassy (i.e., dynamically inactive) phases. Here, in terms of an emergent nonequilibrium correlation length and formulas derived from dynamical facilitation theory [1,2], we describe how glassy states obtained from the large-deviation formalism (i.e., the s-ensemble) are equivalent to the glassy states obtained from nonequilibrium cooling protocols. We test the formulas with lattice models, and we demonstrate that the formulas are consistent with nonequilibrium calorimetry experiments [3].

[1] J. P. Garrahan & D. Chandler, PNAS 100, 9710 (2003)
[2] A. S. Keys et al. Phys. Rev. X 1, 021013 (2011)
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