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Finite-temperature critical point of a glass transition YAEL ELMATAD, University of California, Berkeley, ROBERT JACK, University of Bath, JUAN GARRAHAN, University of Nottingham, DAVID CHANDLER, University of California, Berkeley — We generalize the simplest kinetically constrained models of a glass-forming liquid by softening kinetic constraints, allowing them to be violated with a small rate. We demonstrate that these models support a first-order dynamical (space-time) phase transition between active (fluid) and inactive (glass) phases. The first-order phase boundary in these softened model ends in a finite-temperature dynamical critical point, which may be present in natural systems. In this case, the glass phase has a very large but finite relaxation time. We discuss links between the dynamical critical point and quantum phase transitions, showing that dynamical phase transitions in d dimensions map to quantum transitions in the same dimension, and hence to classical thermodynamic phase transitions in $d + 1$ dimensions.

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