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Dynamical Heterogeneity in Higher Dimensions: Kinetically Constrained Models YOUNJOON JUNG, SOREE KIM, Seoul National University — We use kinetically constrained models to investigate the dimensional dependence of dynamic heterogeneity in supercooled liquid systems. Higher dimensional generalizations of one dimensional East model and its variation with an embedded probe particle are used as a representative fragile liquid system. We first investigate how the breakdown of the Stokes-Einstein relation changes with the system dimensionality from $d = 1$ up to $d = 10$. The fractional scaling behavior $D \propto \tau^{-\xi}$ are observed, where D and ξ are the diffusion constant of the probe and the relaxation time of the liquid, respectively. The scaling exponent, ξ, decreases as the dimensionality increases. The decoupling between persistence and exchange times are also characterized as the dimensionality changes. Time and length scales of the dynamic heterogeneity are analyzed by calculating persistence functions and the dynamic susceptibility. Comparisons are made with respect to recent atomistic MD simulation results.

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