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System-size dependence of dynamical heterogeneity in a glass-forming liquid CHANDAN DASGUPTA, SMARAJIT KARMAKAR, Indian Institute of Science — Dynamical heterogeneity in supercooled liquids is often characterized by a space- and time-dependent higher-order correlation function of local density fluctuations and the corresponding susceptibility (the so-called four-point susceptibility). If the growth of this susceptibility as the temperature is decreased towards the ideal glass transition temperature of mode-coupling theory is a consequence of a growing dynamical correlation length, the dependence of this quantity on the system size should exhibit finite-size scaling behavior. We have used constant-temperature molecular dynamics simulations to study the temperature and sample-size dependence of this quantity for a well-known glass-forming liquid (the Kob-Anderson mixture). Our results show the expected finite-size scaling behavior of the four-point susceptibility in the temperature range over which it exhibits a power-law growth. However, the sample-size dependence of the time scale at which the susceptibility peaks does not exhibit conventional finite-size scaling, possibly indicating the presence of effects not captured in mode-coupling theory.

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