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Dynamical heterogeneities in hard-sphere systems near random close packing W. WENDELL SMITH, PETER WILLIAMS, Yale University, MARK SHATTUCK, City College of New York, COREY O'HERN, Yale University — Hard-sphere systems at finite temperatures diffuse at low packing fraction, but display glassy dynamics as the packing fraction increases toward random close packing (RCP). As the system approaches RCP, structural relaxation dramatically slows down and becomes highly cooperative and heterogeneous in space and time. We quantify dynamical heterogeneities in bidisperse hard-sphere systems as a function of packing fraction near RCP using the non-Gaussian parameter α_2 and four-point density correlation function. We show that α_2 does not diverge, but instead reaches an upper bound < 2 as the packing fraction approaches RCP. We present a simple theoretical model to explain this upper limit.

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