Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Growth of the Cooperative Length Scale Below the Caging Temperature of Glass-forming Liquids BRIAN ERWIN, RALPH COLBY, The Pennsylvania State University, SUDESH KAMATH, The University of Tennessee, SANAT KUMAR, Rensselaer Polytechnic Institute — A cooperative mechanism is invoked to explain the acute property changes observed in glass-forming liquids near the glass transition temperature T_g. This theory implies the existence of cooperatively rearranging regions (CRR) as characterized by a dynamic length scale ξ, which is present in both experiments and simulation. Armed with the temperature dependence of this length scale and the fractal dimension of the CRR (from simulations) a simple scaling model for glassy behavior can be constructed. This scaling model has been applied to measurements of viscosity, the α-relaxation and probe dynamics to estimate the $\xi(T)$ for numerous glass forming liquids.

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Date submitted: 11 Nov 2004 Electronic form version 1.4