Supplementary Information

Microscopic Theory of the Elastic Shear Modulus and Length-Scale-Dependent Dynamic Re-Entrancy Phenomena in Very Dense Sticky Particle Fluids

Anoop Mutneja and Kenneth S.Schweizer

Mean square displacement (MSD) and Non-Gaussian parameter (NGP) plots along $\tau_\alpha^{hop} = 11.3$ isochrone state points
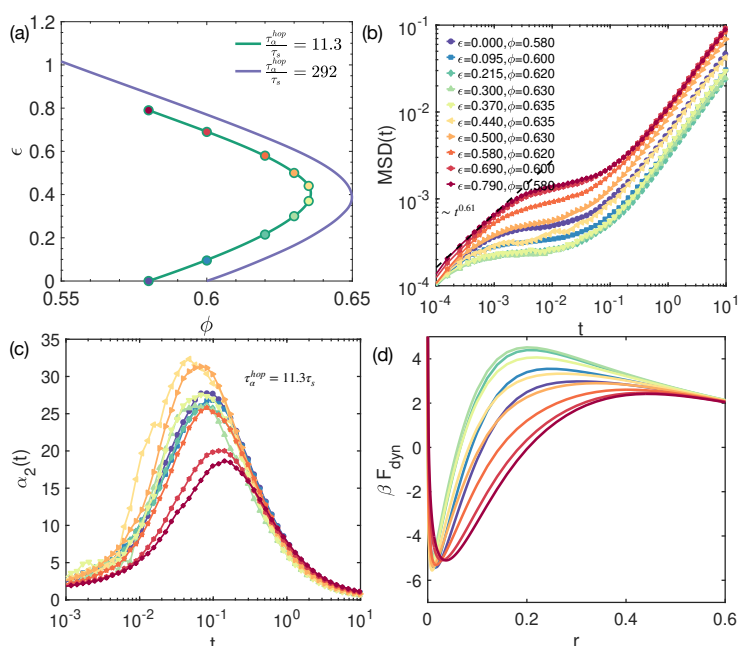

Fig. SI1. Two different Isochrones based on using the hybrid-PDT vertex which are constructed based on a fixed selected value of the mean hopping time corresponding to states of variable packing fraction and attraction strength at a common reduced attraction range of 0.02. The indicated dimensionless hopping time scales are 11.3 and 292, which correspond to local cage barriers of 8.4 and 12.0, respectively. The above figure is similar to Fig. 7(a) of the main text except for the points indicating the specific state points for the isochrone with $\tau_\alpha^{hop} = 11.3$. The Hybrid-PDT vertex based MSD (b) and NGP (c) for the same state points indicated in panel (a). The overall non-monotonic characteristics observed in MSDs and NGPs are qualitatively similar to what is discussed for $\tau_\alpha^{hop} = 292$ isochrone in the main text, but with reduced magnitude, given the less localized state. Pre-caging subdiffusive behavior is also present for attractive glass MSDs. (d) The dynamic free energy curves for the state points indicated in panel (a).