

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Study of Transient Nuclei near Freezing MASAHARU ISOBE,
Nagoya Institute of Technology, BERNI ALDER, Lawrence Livermore National Lab-
oratory — The molasses tail in dense hard core fluids is investigated by extensive
event-driven molecular dynamics simulation through the orientational autocorrela-
tion functions. Near the fluid- solid phase transition, there exist three regimes in
the relaxation of the pair orientational autocorrelation function, namely the kinetic,
molasses (stretched exponential), and diffusional power decay. The density depen-
dence of both the molasses and diffusional power regimes are evaluated and the
latter compares with theoretical predictions in three dimensions. The largest cluster
at the freezing density of only a few sphere diameter in size persist for only about 30
picoseconds ($\sim 2.8 \times 10^{-11}$ [s]). The most striking observation through the bond ori-
entational order parameter is the dramatic increase of the cluster size as the freezing
density is approached.

Masaharu Isobe
Nagoya Institute of Technology

Date submitted: 31 Oct 2010

Electronic form version 1.4