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Fluctuating Relaxation Times in Glass-forming Liquids GCINA A. MAVIMBELA, HORACIO E. CASTILLO, Department of Physics and Astronomy, Ohio University, Athens OH, AZITA PARSAEIAN, Materials Research Center, Northwestern University, Evanston IL — The presence of fluctuating local relaxation times, $\tau(\vec{r},t)$ has been used for some time as a conceptual tool to describe dynamical heterogeneities [**?**]. Here we report on a new method for determining the local phase field, $\phi(\vec{r},t) \equiv \int^t \frac{dt'}{\tau(\vec{r},t')}$ from snapshots $\{\vec{r}(t_i)\}_{i=1...M}$ of the positions of the particles in a system, and we apply it to extract $\phi(\vec{r},t)$ from simulations of glass forming models. By studying how the phase field depends on the number of snapshots, we find that it is a well defined quantity. By studying fluctuations of the phase field, we find that they describe heterogeneities well at long distance scales. We also determine how the stretching exponent β depends on the coarse graining volume, in order to test the hypothesis that relaxation in small regions is exponential and it only becomes non-exponential when considering large regions of the system.

[1] M. D. Ediger, 2000 Annu. Rev. Phys. Chem. **51** 99

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