

Abstract Submitted
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Four-Point Analysis of Molecular Fluctuations in Sucrose Benzoate Near the Glass Transition by Fourier Imaging Correlation Spectroscopy JAMES UTTERBACK, Department of Physics, University of Oregon, JASPER COOK, Department of Chemistry, University of Oregon, ANDREW MARCUS, Department of Chemistry, University of Oregon, Eugene, OR 97403 — Glass-forming liquids exhibit broad heterogeneous distributions of relaxations. It is of considerable importance to determine the detailed forms of these distributions in order to understand how fast and slow processes are partitioned, and how they couple over time. Such information is available through four-point correlation and distribution functions. We present initial fluorescence fluctuation measurements of probe molecule rotation and translation in the glass forming liquid sucrose benzoate. These measurements are performed using a unique method called polarization-modulated Fourier imaging correlation spectroscopy (PM-FICS), which can simultaneously measure molecular center-of-mass motions and optical anisotropy fluctuations. By combining PM-FICS with single-molecule imaging techniques, we construct two-dimensional spectral densities and joint distribution functions that establish temporal correlations of microscopic coordinates over successive time intervals.

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