Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Continuous monitoring of structural dynamics in polymer assemblies. JOSE RAFAEL GUZMAN SEPULVEDA[1], JINAN DENG[2], JIYU FANG[3], ARISTIDE DOGARIU[4], Univ of Central Florida — Due to their flexibility, optical methods are preferred approaches for monitoring the dynamics and mechanical properties of scattering systems such as polymer solutions, colloidal suspensions, and complex media in general. In particular, their potential noninvasiveness is critical for the passive assessment of dynamic processes. Practical implementations however suffer sometimes from limitations due to effects such as multiple scattering or strong attenuation. Here we introduce an optical technique that overcomes some of these limitations and permits accessing the dynamics of complex colloidal systems under realistic conditions and inherent external influences. This interferometric technique operates based on the coherence-gated isolation of single scattering and allows for the spatially-resolved evaluation of the system's dynamics in optically isolated picoliter-sized volumes. This effective isolation permits a fully passive characterization of nonstationary dynamic processes in complex systems including aggregation and self-assembling, sedimentation, structural evolution and phase transitions, interface dynamics, and dynamics in inhomogeneous or stratified solvents.

[1]CREOL, The College of Optics and Photonics.
[2]Department of Materials Science and Engineering, The College of Optics and Photonics.
[3]Department of Materials Science and Engineering, The College of Optics and Photonics.
[4]CREOL, The College of Optics and Photonics.

Jose Rafael Guzman Sepulveda
Univ of Central Florida

Date submitted: 06 Nov 2015 Electronic form version 1.4