Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Investigating the Diffusive Behavior of HPC with DLS and FPR: A Comparative Analysis of Experimental Method RYAN MCDONOUGH, Cleveland State University, PAUL RUSSO, Louisiana State University, KIRIL STRELETZKY, Cleveland State University — The study of HPC (Hydroxy-propyl-cellulose) chains in aqueous solution through the experimental techniques of FPR (Fluorescence Photo-bleaching Recovery) and DLS (Dynamic Light Scattering) has shown empirical inconsistencies in observed polymer dynamics. The approach to analyzing the inconsistencies consisted of preparing fluorescently labeled and unlabeled HPC solutions at a range of concentrations from the same stock solution. Results from DLS have indicated the reliable presence of a slow mode of diffusion in both labeled and unlabeled samples. The slow mode appeared in FPR experiments, but not reproducibly. In addition, results from DLS on labeled and unlabeled HPC have found startling differences in line shape of correlation function indicating signal detection from an unknown mechanism. Future directions for this study include an investigation into the reasons behind the before mentioned inconsistencies and an analysis of HPC solutions with different fluorescent labels to further explore the nature of the slow diffusion mode if it is determined not to be an artifact from sample preparation, or an unknown aspect particular to DLS studies.

Ryan McDonough
Cleveland State University

Date submitted: 02 Dec 2007 Electronic form version 1.4