Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Particle Dynamics within Self-Assembling Polymer-Grafted Spherical Nanoparticles PINAR AKCORA, University of Missouri, SANAT K. KUMAR, Columbia University, YU LI, BRIAN BENICEWICZ, University of South Carolina, SURESH NARAYANAN, Argonne National Laboratories, COLUMBIA UNIVERSITY COLLABORATION, UNIVERSITY OF SOUTH CAROLINA COLLABORATION, ARGONNE NATIONAL LABORATORY COLLABORATION —
We have recently shown that the self-assembly of polymer grafted spherical nanoparticles can be achieved by varying the brush grafting density and chain length. The mechanical behavior of these nanocomposites with various states of particle dispersion has been explored using x-ray photon correlation spectroscopy. Nanoscale and macroscopic dynamic measurements show that mechanical reinforcement results from the percolated and also strongly entangled brushes forming strong networks. Particle dynamics within various polymeric nanostructures will be discussed.

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Date submitted: 15 Dec 2008 Electronic form version 1.4