

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Origin of glass transition temperature behavior in polymer nanocomposites** JAMIE KROPKA, VENKAT GANESAN, The University of Texas at Austin, PETER GREEN, The University of Michigan — Local composition variations inherent in multi-component materials, even when the material constituents are miscible, generally lead to heterogeneous behavior in the properties of mixtures relative to their single component counterparts. In contrast, experiments have suggested that some polymer nanocomposite materials exhibit changes in their bulk  $T_g$  without displaying excess heterogeneity in their dynamics, as measured mechanically, relative to the neat polymer. Incoherent neutron scattering measurements on materials that fit this description,  $C_{60}$ -PMMA mixtures, suggest that modifications of the polymer melt dynamics are limited to the vicinity of the particles. A model by which the localized modifications of polymer dynamics can account for the apparent homogeneous change in  $T_g$  is proposed to explain the experimental findings. Computations based on percolation theory support the model.

Jamie Kropka  
The University of Texas at Austin

Date submitted: 26 Nov 2007

Electronic form version 1.4