

Abstract Submitted  
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**A NanoThermal Analysis Method for Mapping Glass Transitions in Heterogeneous Soft Matter Films**<sup>1</sup> M.P. NIKIFOROV, S. GAM, S. JESSE, R.J. COMPOSTO, S.V. KALININ, ORNL TEAM, UNIVERSITY OF PENNSYLVANIA TEAM — Polymer thin films are utilized in many present day technologies because they exhibit attractive physico-chemical properties. By combing mixtures of polymers, new combinations of properties can be achieved that impart the coating with functionality, improved processibility and lower cost. Because these coatings are usually subjected to a range of environmental conditions (heat, moisture, pressure), the initial, desired properties can be perturbed because of phase separation, phase coarsening, and interfacial segregation. In this work we introduce a new method for local thermal analysis of polymeric materials (BE-NanoTA), which allows the measurement of glass transition temperature with 50 nm point-to-point resolution, provides new insight into domain growth of a model polymer blend system. Virtually non-destructive nature of BE-NanoTA allows for in-situ phase evolution studies for many soft matter systems containing multiple components such as polymer nanocomposites where the filler can perturb the local dynamics and corresponding processibility, mechanical properties, optical properties etc.

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