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### **Surface Dynamics in Glass forming Materials<sup>1</sup>**

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There is mounting evidence that the surface of glassy polymers exhibits enhanced dynamics compared to the bulk material at the same temperature. Using nanoparticle embedding and relaxation of nanodeformations on the surface, we have developed a detailed characterization of the dynamics of glassy polymers (polystyrene (PS), isotactic-poly(methyl methacrylate) ). This includes the effects of temperature, molecular weight and film thickness on the surface dynamics. We have extended the studies to the molecular glass former TNB, which display striking similarities to PS. The results of these studies allow us to begin to develop an understanding of the surface properties of glassy material, and how these properties may lead to observed changes in thin film polymer properties.

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