

Abstract Submitted
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A Simple Approach to Free Volume Transport in Molten/Glassy Material¹ JANE LIPSON, Dartmouth College, SCOTT MILNER, Penn State University, NICHOLAS TITO, Dartmouth College — A key component of microscopic models for the glass transition, in polymer thin films and more generally, is the local dynamics of free volume, which governs what portions of a near-glassy liquid are mobile at a given instant in time. For example, our recent Delayed Glassification (DG) model implements a proposal of de Gennes that segment-sized kinks of free volume may travel from a free surface into a film along polymeric loops or bridges, helping to plasticize material within some accessible distance from the surface. Recently, we have constructed a simple model for ‘the mobility of mobility’, i.e., how local mobility is itself transported through a dense liquid slightly above T_g . Our simple model results in growing cooperativity lengths and intermittency timescales as T_g is approached from above. If time permits, we shall also describe how the model may be adapted to describe the approach to glassy behavior in supported and freestanding films.

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