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**A Thermodynamic Model for Glass Transition Shifts in Freestanding and Supported Films** CHRIS PRICE, RONALD WHITE, JANE LIPSON, Dartmouth College — The thickness dependence of the glass transition temperature in polymer thin films is investigated via an analytical approach relying only on bulk material data. Previously, this method had been used to successfully model freestanding polystyrene (PS) films. In this discussion, new model results are shown for freestanding poly (methyl methacrylate) (PMMA) that capture the difference in its thickness dependent glass transition shift relative to polystyrene. Furthermore, the simple model is generalized to study supported polymer films. We show that the inclusion of a polymer-substrate interaction can cause a flip in the glass transition shift from depression to enhancement. We estimate the strength of this interaction for the case of PMMA on a silicon oxide substrate using a simple physical model.

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