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Mechanical Properties of Polystyrene Brush Films[1] ANDREW CLOUGH, YOSHIHISA FUJII, ZHAOHUI YANG, OPHELIA TSUI, Department of Physics, Boston University — Fifteen years ago, Fredrickson et al. [*Macromolecules* **1992,** 25, 2882-2889] predicted that a molten polymer brush possesses a shear modulus that would cause the surface structure to deviate from that of a liquid. Their predictions, though broadly used, have been largely unchecked. Here, we present experimental data on polystyrene PS brushes that validate Fredrickson et al.'s predictions. Measurement obtained by following the time evolution of the surface structure of a brush shows that the shear modulus of the brush is established prior to the onset of the terminal flow regime, suggesting that the entropic elasticity in the brush chains needed to bring about the solid behavior of the brush is operative already in the rubbery regime.

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