

Abstract Submitted
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Macromolecular Liquids Slip Over Solid Surfaces: Experimental Studies of the Slip Length¹ KARIN JACOBS, RENATE FETZER, Saarland University, Dept. of Experimental Physics, 66041 Saarbruecken, Germany — We present a novel method to assess the slip length and viscosity of thin films of highly viscous Newtonian liquids. We quantitatively analyze dewetting fronts of low molecular weight polystyrene melts on Octadecyl- (OTS) and Dodecyltrichlorosilane (DTS) polymer brushes [1]. Using a thin film (lubrication) model derived in the limit of large slip lengths, we can extract slip length and viscosity of films with thicknesses between 50 nm and 230 nm and temperatures above the glass transition. We find slip lengths from 100 nm up to 1 micron on OTS and between 300 nm and 10 microns on DTS covered silicon wafers. The slip length decreases with temperature. The obtained values for the viscosity are consistent with independent measurements [2]. [1] R. Fetzer, K. Jacobs, A. Muench, B. Wagner, T.P. Witelski, Phys. Rev. Lett. 95, 127801 (2005) [2] R. Fetzer, K. Jacobs, M. Rauscher (to be published)

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Karin Jacobs
Saarland University, Dept. of Experimental Physics, 66041 Saarbruecken, Germany

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