

Abstract Submitted
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Slippage of polymers: Influence of the chemical structure MISCHA KLOS, Experimental Physics, Saarland University, OLIVER BÄUMCHEN, Dept. of Physics & Astronomy, McMaster University, MATTHIAS LESSEL, KARIN JACOBS, Experimental Physics, Saarland University — The continuing miniaturization of microfluidic devices causes a growing importance of the solid/liquid interface for the flow dynamics. Our experiments probe slippage using the dewetting process of thin polymer films on hydrophobic substrates. As hydrophobic coatings we use amorphous polymers (AF1600, AF2400) and different types of highly ordered self-assembled silane monolayers on top of ultraflat silicon substrates. Polystyrene (PS) of low molecular weight shows slip lengths between several hundreds of nanometers and even micrometers on silane surfaces [1], whereas on AF1600 nearly no slip is observable. However, slip can be induced by increasing the molecular weight of the PS [2]. Recent studies using scattering techniques showed an ordering effect of PS at the solid/liquid interface depending on the structure of the substrate [3]. Will the situation change if, instead of PS, polymethyl methacrylate (PMMA) is used? To probe the influence of the polymers composition on slippage, we show very first results of the dewetting dynamics of PMMA on AF2400.

- [1] R. Fetzer, et. al., Europhys. Let., 75, no. 4, 638 (2006)
- [2] O. Bäümchen, et al., PRL, 103, 247801 (2009)
- [3] P. Gutfreund, et. al., arxiv.org 1104.0868v1 (2011, April 5)

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