

Abstract Submitted
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Wetting on surfaces with tailored nano-scale defects KRISTINA DAVITT, ROMAIN LHERMEROUT, ETIENNE ROLLEY, Laboratoire de Physique Statistique de l'ENS Paris — Surface heterogeneity is acknowledged as a cause of contact angle hysteresis. More recently, it has also been recognized as having an important effect on contact line dynamics [1]. However, it has proven difficult to design quantitative experiments [2]. There are two fundamental difficulties: (i) to control the heterogeneity and (ii) to fabricate a true reference surface. In many methods, additional well-controlled defects may be added to a surface, however, the untreated substrate itself already presents some chemical or topographical disorder (typically nano-scale). This is illustrated by the fact that even on a purportedly defect-free surface the hysteresis is non-negligible ($>$ a few degrees). We report on the use of adsorbed short-chain polymer surfaces as nearly ideal reference surfaces ($H < 0.01^\circ$). Topographical defects of controlled size, shape and density are then added using nanosphere lithography with dilute colloidal suspensions, and the dependence of the hysteresis and low-velocity dynamics on the defect parameters are determined.

[1] K. Davitt *et al.*, *Langmuir* **29**, 6884 (2013).

[2] S.M.M. Ramos *et al.*, *Phys. Rev. E* **67**, 031604 (2003).

Kristina Davitt
Laboratoire de Physique Statistique de l'ENS Paris

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