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Capillary forces during liquid nanodispensing[1] THIERRY ONDARCUHU, HUGO DUROU, AIPING FANG, CEMES-CNRS, Toulouse — Liquid nanodispensing (NADIS) is a recently developed method to deposit and manipulate small volumes of liquids (down to 100 zeptoliter) on a surface [1]. This atomic force microscope (AFM)-based method uses a nanochannel milled by focused ion beam (FIB) at the apex of a hollow AFM tip to transfer liquid from a reservoir located on the cantilever, to the surface. The smallest droplets (70 nm in diameter) contain, for standard dilutions, only few molecules opening the way to single molecule deposition. We present here a study of the capillary force exerted on the tip during the deposition. Using the "surface evolver" software, we simulated the force curves measured by AFM, which is the only available data during deposition. The good agreement between experimental and calculated curves gives important information on the liquid transfer mechanism and provides a real-time control of the deposition during the process [2].
[1] A.Fang, E. Dujardin, T.Ondarcuhu, NanoLett. 6 (2006) 2368.
[2] T.Ondarcuhu et al, Eur. Phys. J. ST. (2008) in press.

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