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Dynamics of anchored oscillating nanomenisci[1] THIERRY ONDARÇUHU, CAROLINE MORTAGNE, CEMES-CNRS, Toulouse, France, KEVIN LIPPERA, LadHyX, Ecole Polytechnique, Palaiseau, France, PHILIPPE TORDJEMAN, IMFT, Toulouse, France, MICHAEL BENZAQUEN, LadHyX, Ecole Polytechnique, Palaiseau, France — The study of liquid dynamics in the close vicinity of the contact line is fundamental to understand the physics of wetting. In this context, we present a self-contained study of the dynamics of oscillating nanomenisci anchored on topographical defects around a cylindrical nanofiber (radius below 100 nm). Using frequency-modulation atomic force microscopy (FM-AFM) with dedicated tips, we show that the friction coefficient surges as the contact angle is decreased. We propose a theoretical model within the lubrication approximation that reproduces the experimental data and provides a comprehensive description of the dynamics of the nanomeniscus. The dissipation pattern in the vicinity of the contact line and the anchoring properties of the defects are discussed as a function of liquid and surface properties in addition to the solicitation conditions and defects size.

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