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**Evaporation of a drop on a periodic solid substrate with moving contact-line** AMIRHOSSEIN AMINI, Mechanical Engineering UW, GEORGE. M. HOMSY, Mechanical Engineering — Experiments on evaporating droplets on structured surfaces have shown that the contact line does not move with constant speed, but rather in a step-like, "stick-slip" fashion. As a first step in understanding this phenomenon, we study the evolution of a 2D incompressible Newtonian droplet evaporating on a non-flat substrate. We deploy a standard one-sided model which, together with the lubrication approximation, results in an evolution equation for the local height of the droplet. This is solved numerically for the case of constant fixed contact angle by utilizing numerical slip. We present results for sinusoidal substrates of different dimensionless amplitudes and wavelengths, with the droplet profile, evaporative mass flux and contact-line position evaluated for each case. In contrast with our previous results for a flat substrate, for which the contact line recedes in a nearly constant speed, we observe that the contact line speed and position show significant time variation, with the contact line moving approximately in a step-like fashion for relatively steep substrates.

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