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Wetting Morphologies in Triangular Grooves[1] KRISHNACHARYA KAREH, MARTIN BRINKMANN, STEPHAN HERMINGHAUS, RALF SEEMANN, MPI for Dynamics and Self-Organisation, D-37073 Goettingen, BRUCE LAW, Kansas State University, Manhattan, KS 66506 — We studied the wetting behavior of liquids in triangular grooves with chemically homogeneous walls. Droplets form elongated morphologies with negative mean curvature for contact angles, θ, smaller than 90° minus half the opening angle of the groove. For larger θ, the liquid either forms elongated filaments of finite length and positive mean curvature or drop-like morphologies. For in situ manipulation of small amounts of liquid on this substrate topography, we used electrowetting which allows varying θ as a function of the applied Voltage. The filling and drainage behavior of these grooves were studied as a function of time and θ. In contrast to grooves with rectangular cross section, the liquid filaments in triangular grooves undergo a dynamic instability when being quenched from a filling to a non-filling situation. The liquid filament breaks up into isolated droplets with a preferred distance which compares favorably with a straightforward theoretical model.

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