Wetting Morphologies in Triangular Grooves\textsuperscript{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, $\theta$, smaller than $90^\circ$ minus half the opening angle of the groove. For larger $\theta$, 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 $\theta$ as a function of the applied Voltage. The filling and drainage behavior of these grooves were studied as a function of time and $\theta$. 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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Ralf Seemann

MPI for Dynamics and Self-Organization, Bunsenstrasse 10, D-37073 Goettingen, Germany

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