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Dewetting on microstructured substrates[1] TAEHONG KIM, WON-JUNG KIM, Sogang Univ — A thin liquid film has an equilibrium thickness in such a way as to minimize the free energy. When a liquid film thickness is out of its equilibrium, the film seeks its equilibrium state, resulting in dynamics of liquid film, which are referred to as wetting and dewetting, depending on the flow direction. We here present a combined experimental and theoretical investigation of dewetting on a substrate with parallel microstructures. Our experiments show that residue may remain on the substrate after dewetting, and residue morphologies can be classified into three modes. Based on our experimental observations, we elucidate how the modes depend on the pattern morphology and contact angle, and develop a model for the contact line motion. Our results provide a basis for controlling the thickness film, which is important for many practical applications such as oil recovery, detergency, lithography, and cleaning.

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Taehong Kim
Sogang Univ

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