Supplementary material

Fingering instability in adhesion fronts

by Manon l'Estimé, Laurent Duchemin, Etienne Reyssat and José Bico

Description of supplementary movies

Supplementary Movie 1:

The movie shows a preliminary experiment from above. Two glass plates are coated with oil layers of thickness $h \simeq 100$ μm and viscosity $\eta = 50$ mPa.s. The upper plate is initially deposited on top of the lower plate, and the oil layers merge following a complex and disorganised fingering pattern. We use a reflected light configuration in which the regions where the films have merged appear dark, while the parts where an air layer still separates the oil films appear clearer. The movie plays two times slower than real time.

Supplementary Movie 2:

A controlled experiment is shown from above. The glass plates are covered with layers of silicone oil of thickness $h \simeq 100$ μm and viscosity $\eta = 50$ mPa.s. The plates are form a sharp wedge of angle $\alpha = 0.07°$. The apex of the wedge is located along the left boundary of the image. The oil is colored in blue using a dye from Esprit Composite®. The adhesion of both plates occurs through the propagation of an unstable front with a well organised fingering pattern guided by the gradient of confinement. We use a backlighting configuration in which the regions where oil layer have merged appear dark blue, while the parts separated by an air film appear clearer. Between the oil fingers, air channels appear almost white, as the initial fluid layers have been drained to form the oil fingers that bridge the facing plates. The movie plays in real time.