# Dynamics of viscous adhesion : From elongated capillary bridges to fingering instability

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**Abstract**

The adhesion of solid surfaces forming a sharp wedge and coated with a viscous liquid occurs through the merging of both adhesive layers. As the adhesion front chases the air and progresses in the narrow gap separating both surfaces, it sometimes undergoes fingering. To explore this instability, we first address the model problem of a single finger of wetting liquid bridging a bath and a beam placed slightly over the surface of the bath. We show that the dynamics of this finger strongly depends on the viscosity of the liquid, on the depth of the pool, and on the gap separating the liquid surface and the overhanging beam. We then proceed to the description of the fingering instability that occurs when putting two lubricating surfaces in contact, and present how the fingers dynamics is influenced by the angle between the solid surfaces, the amount of liquid available, and the physical properties of the liquid.

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