

Shaping Liquid: Effect of Surface Roughness on Liquid Sheets

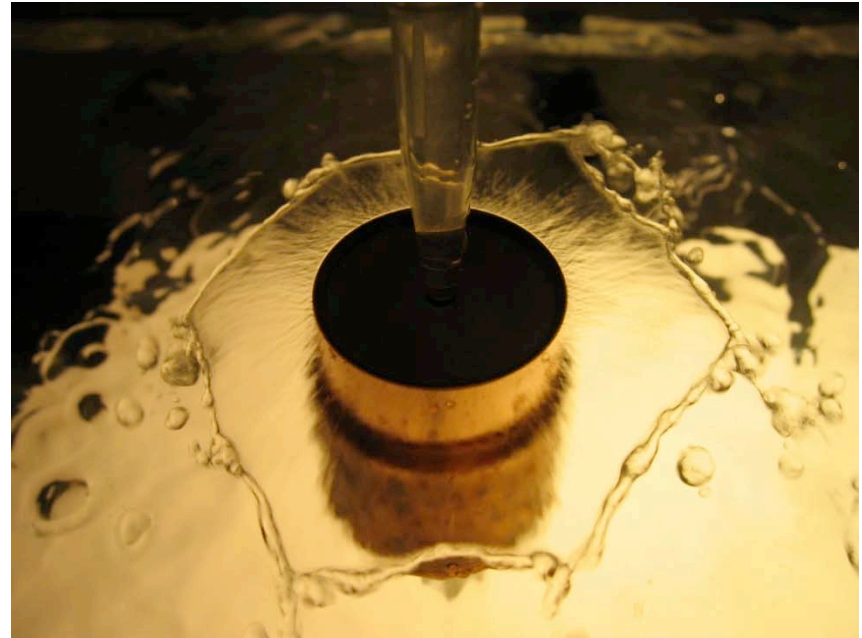
Adrian Delancy¹, Howard A. Stone², Laurent Courbin², Emilie Dressaire²

¹Purdue University, ²Harvard University

Liquid sheets are the familiar entities obtain when a jet of liquid impacts a small target. After impact the liquid is then ejected off of the surface, forming a thin layer of liquid in air. Here we study the effect of target roughness on the shape, size and stability of these liquid sheets.

A polymer substrate, produced by methods of nanofabrication, textured with micron size posts arranged in regular arrays is used as the surface target.

As a result of the arrangement of posts on the surface of the targets, the liquid sheets take on polygonal shapes. For example, a liquid sheet produced upon impact of a target with posts in a hexagonal lattice structure adopts a hexagonal shape. This study shows that changes at the microscopic level can have dramatic effects at the macroscopic level.



Hexagonal Liquid Sheet produced after impact of a water jet on a target with micron-size posts arranged in a hexagon pattern.

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