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Polygonal hydraulic jump on microtextured surfaces EMILIE DRESSAIRE, LAURENT COURBIN, SEAS, Harvard University, JEROME CREST, Dept. of Mechanical Engineering, MIT, HOWARD A. STONE, SEAS, Harvard University — Fluid motion can be drastically influenced by the nature of boundaries. For instance, we have shown recently [1] that a substrate with a regular array of micron-size posts can cause partially wetting fluids to take on polygonal shapes. Here, we report on the hydraulic jump that occurs when a water jet impinges a topographically patterned surface, i.e. an array of micron-size posts arranged on square or hexagonal lattice. By varying the topographic features (shape and height of the posts, lattice distance) and the jet properties (size of the nozzle, flow rate), we obtain a variety of stable shapes including hexagons, eight corner stars and circles. We rationalize our results by taking into account a fluid velocity that depends on the orientation of the lattice.

[1]L. Courbin, E. Denieul, E. Dressaire, M. Roper, A. Ajdari and H.A. Stone, Nature Mater. **6**, 661 (2007)

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