

Abstract Submitted
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Hydraulic jump in falling soap films TUAN TRAN, PINAKI CHAKRABORTY, GUSTAVO GIOIA, University of Illinois at Urbana-Champaign, STANLEY STEERS, WALTER GOLDBURG, University of Pittsburgh — We perform experiments to study the flow of soap films driven by gravity. We find that the velocity of the flow attains a maximum value after the film has fallen for about 1m under the effect of gravity, but then the velocity drops rapidly to a low value at the outlet. We show theoretically and computationally that the drop in velocity corresponds to a hydraulic jump associated with the Marangoni elasticity of the soap film. We support our conclusions by a detailed comparison between our experimental measurements and computations.

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