Abstract Submitted
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**Turbulent Dynamics of a Hydraulic Jump in two dimensions: Soap film flow**[1] JASON LARKIN, WALTER GOLDBURG, University of Pittsburgh, TUAN TRAN, PINAKI CHAKRABORTY, GUSTAVO GOIA, University of Illinois Urbana — A hydraulic jump is an abrupt and (usually) turbulent transition frequently observed in open channel flows. By using an appropriately defined Froude number $Fr$, the abrupt flow transition is marked by a change from supercritical to subcritical flow. In open channels this results in fast moving flow slowing rapidly and piling up like the formation of a shockwave. The Froude number is $Fr = V/V_c$, where V is the flow speed and $V_c$ is the relevant wave speed. If the initial speed of the flow is below the relevant critical wave speed ($Fr < 1$), then no jump is formed. For $Fr > 1$, we study the effects of a hydraulic jump in a two dimensional (2-D) flowing soap film. The relevant wave speed, $V_c$, is the speed of elastic Marangoni waves from surface tension. The jump manifests itself as a sudden thickening of the film in the flow direction and the generation of turbulence in the vicinity of the jump. Properties of the turbulence, including energy spectra, near the thickening transition are reported.

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