

Abstract Submitted
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Influence of Geometry on Instability: Breakup of fluid strips with square-wave perturbations¹ KYLE MAHADY, SHAHRIAR AFKHAMI, LOU KONDIC, New Jersey Institute of Technology — Recent work² has demonstrated experimentally and computationally that an originally flat structure with an imposed nonlinear square-wave perturbation applied to the edges could break up in a variety of ways. In this talk we will report on the results of a computational study that centers on solving the Navier-Stokes equations using a volume of fluid approach. We focus on exploring the details of the breakup mechanism and on the influence of the initial fluid shape on the instability development. One unexpected result is the finding that the initial geometry may strongly influence the outcome, and in particular lead to closely spaced array of drops. The size and spacing of the drops is found to be strongly influenced by nonlinear stages of the evolution, and cannot be predicted based on the Rayleigh-Plateau instability mechanism.

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²Roberts, N., Fowlkes, J., Mahady, K., Afkhami, S., Kondic, L. and Rack, P. *ACS Applied Materials and Interfaces* **2013**, 5, 4450.

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