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Finite plate thickness effects on the Rayleigh-Taylor instability in elastic-plastic materials[1] RINOSH POLAVARAPU, ARINDAM BANERJEE, Lehigh University — The majority of theoretical studies have tackled the Rayleigh-Taylor instability (RTI) problem in solids using an infinitely thick plate. Recent theoretical studies by Piriz et al. (PRE **95**, 053108, 2017) have explored finite thickness effects. We seek to validate this recent theoretical estimate experimentally using our rotating wheel RTI experiment in an accelerated elastic-plastic material. The test section consists of a container filled with air and mayonnaise (a non-Newtonian emulsion) with an initial perturbation between two materials. The plate thickness effects are studied by varying the depth of the soft-solid. A set of experiments is run by employing different initial conditions with different container dimensions. Additionally, the effect of acceleration rate (driving pressure rise time) on the instability threshold with reference to the finite thickness will also be inspected. Furthermore, the experimental results are compared to the analytical strength models related to finite thickness effects on RTI.

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Arindam Banerjee
Lehigh University

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