

Abstract Submitted  
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**Effects of acceleration rate on Rayleigh-Taylor instability in elastic-plastic materials.**<sup>1</sup> ARINDAM BANERJEE, RINOSH POLAVARAPU, Lehigh University — The effect of acceleration rate in the elastic-plastic transition stage of Rayleigh-Taylor instability in an accelerated non-Newtonian material is investigated experimentally using a rotating wheel experiment. A non-Newtonian material (mayonnaise) was accelerated at different rates by varying the angular acceleration of a rotating wheel and growth patterns of single mode perturbations with different combinations of amplitude and wavelength were analyzed. Experiments were run at two different acceleration rates to compare with experiments presented in prior years at APS DFD meetings and the peak amplitude responses are captured using a high-speed camera. Similar to the instability acceleration, the elastic-plastic transition acceleration is found to be increasing with increase in acceleration rate for a given amplitude and wavelength. The experimental results will be compared to various analytical strength models and prior experimental studies using Newtonian fluids.

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