

Abstract Submitted  
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**Exploring elastic and plastic regimes of Rayleigh-Taylor instability in solids**<sup>1</sup> RINOSH POLAVARAPU, ARINDAM BANERJEE, Lehigh University — The elastic-plastic (EP) transition stage of Rayleigh-Taylor (RT) instability was studied in an accelerated elastic-plastic solid. A novel rotating wheel RT experiment with linear vibratory motion that centrifugally accelerates a test section with two-material interface was utilized. The test section consists of a container filled with air and mayonnaise, a non-Newtonian emulsion, with an initial perturbation between the two materials. Single mode perturbations of various amplitudes and wavelengths were analyzed earlier to find the effects of initial conditions on instability acceleration. Presently, the EP transition process for a stable interface before reaching the instability was verified by accelerating the test section to a magnitude which is slightly less than critical acceleration and imparting linear vibration which alters the radius of circular path and thus varies the magnitude of centrifugal force. The results were compared with various instability and EP transition criteria given by analytical growth models.

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