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Richtmyer-Meshkov instability in elastic-plastic media ANTONIO R. PIRIZ, JUAN J. LÓPEZ CELA, Universidad de Castilla - La Mancha, NAEEM A. TAHIR, GSI Darmstadt, DIETER H. H. HOFFMANN, Technical University of Darmstadt — Hydrodynamic instabilities are of great importance in the LAPLAS (Laboratory of Planetary Sciences) experiment that is being designed for the study of high energy density states of matter in the framework of the FAIR projectDuring the implosion of the LAPLAS cylindrical target Richtmyer-Meshkov (RM) instability occurs when a shock is launched into a material pusher with elastic and plastic properties that determines the physics of the instability evolution. We have studied the evolution of the interface from which the shock is launched as a consequence of the RM instability. For this we have developed an analytical model and we have performed two-dimensional numerical simulations in order to validate the model. Model and simulations show the asymptotic stability state in which the interface oscillates elastically around a mean value higher than the initial perturbation amplitude. Such a mean value is determined by an initial plastic phase. Applications to the measurement of the yield strength of materials under extreme conditions are foreseen.

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