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Maximum initial growth-rate of strong-shock-driven Richtmyer-Meshkov instability[1] SNEZHANA I. ABARZHI, The University of Western Australia, AKLANT K. BHOWMICH, Carnegie Mellon University, USA, ZACHARY R. DELL, The Ohio State University, USA, ARUN PANDIAN, Carnegie Mellon University, USA, MILOS STANIC, FluiDyna GmbH, Germany, ROBERT F. STELLINGWERF, Stellingwerf Consulting, USA, NORA C. SWISHER, Carnegie Mellon University, USA — We focus on classical problem of dependence on the initial conditions of the initial growth-rate of strong shocks driven Richtmyer-Meshkov instability (RMI) by developing a novel empirical model and by employing rigorous theories and Smoothed Particle Hydrodynamics (SPH) simulations to describe the simulations data with statistical confidence in a broad parameter regime. For given values of the shock strength, fluids density ratio, and wavelength of the initial perturbation of the fluid interface, we find the maximum value of RMI initial growth-rate, the corresponding amplitude scale of the initial perturbation, and the maximum fraction of interfacial energy. This amplitude scale is independent of the shock strength and density ratio, and is characteristic quantity of RMI dynamics. We discover the exponential decay of the ratio of the initial and linear growth-rates of RMI with the initial perturbation amplitude that excellently agrees with available data.

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