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The Bipolar Behavior of the Richtmyer–Meshkov Instability[1] FERNANDO GRINSTEIN, Los Alamos National Laboratory, AKSHAY GOWARDHAN, Lawrence Livermore National Laboratory, RAYMOND RISTORCELLI, Los Alamos National Laboratory
— A numerical study of the evolution of the multimode planar Richtmyer-Meshkov instability (RMI) in a light-heavy (air-SF6, Atwood number A=0.67) configuration involving a Mach number Ma=1.5 shock is carried out. Our results demonstrate that the initial material interface morphology controls the evolution characteristics of RMI (for fixed A, Ma), and provide a significant basis to develop metrics for transition to turbulence. Depending on initial rms slope of the interface, RMI evolves into linear or nonlinear regimes, with distinctly different flow features and growth rates, turbulence statistics, and material mixing rates. We have called this the bipolar behavior of RMI.

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Fernando Grinstein
Los Alamos National Laboratory

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