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Experimental and numerical study of the single-mode three-dimensional Richtmyer-Meshkov instability. VITALIY KRIVETS, CHRISTOPHER LONG, JEFFREY JACOBS, University of Arizona, JEFFREY GREENOUGH, Lawrence Livermore National Laboratory — A vertical shock tube is used to perform experiments on the single-mode three-dimensional Richtmyer-Meshkov instability. The interface is formed using apposed flows of air and SF₆ (with an Atwood number of 0.66) and the three-dimensional single-mode perturbation is created by the periodic vertical motion of the gases within the shock tube. Planar laser induced fluorescence still images in addition to planar Mie scattering movies are acquired. Richtmyer-Meshkov instability is produced by impulsive acceleration by a weak shock wave ($M_s = 1.2$). A three-dimensional numerical simulation of this experiment utilizing the Eulerian adaptive mesh refinement code Raptor was also conducted. The results of this simulation are compared with the experimental images and measurements.

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