Abstract Submitted
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Growth of Richtmyer-Meshkov turbulence when reshocked in the same direction. ISMAEL BOUREIMA, Los Alamos National Laboratory, PRAVEEN RAMAPRABHU, Univ of North Carolina - Charlotte, KARNIG MIKAELIAN, Lawrence Livermore National Laboratory, RMI DOUBLE SHOCK COLLABORATION — This work extends the theta-group study [1] by investigating the effect of multiple shocks originating in the heavier fluid, and their effect on the subsequent evolution of the Richtmyer-Meshkov (RM) turbulent mixing layer. Our objective is to investigate the effect of the second shock arrival time on several turbulent flow features. By varying the time of second shock impact, we control the properties of the interface (composition of perturbation wavelengths and amplitudes) prior to this event. Our primary interest is to quantify mixing properties resulting from the RM instability, which is one of the sources of mixing-led deterioration of fusion yield in ICF. While RM-driven turbulent mixing has been extensively investigated, the majority of studies have focused on mixing from either a single incident shock or a reflected shock in the opposite direction. In a departure from these studies, we study mix properties from second shock of direct relevance to recent efforts to optimize the timing and strength of shocks in ICF [2]. Similarly, in SCRAMJET applications, to satisfy the requirement of minimal residence times for the fuel jets, a shock train is used to repeatedly shock and achieve turbulence in the flow. [1] B. Thornber et al. , Phys. Fluids 29, 105107 (2017). [2] H.F. Robey et al., Phys. Rev. Lett., 108, 215004 (2012).

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