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A Numerical Study of Shock-Bubble Multiple Interaction[1] LINGLING WU, XIAOLIN LI, SUNY at Stony Brook — This paper studies the numerical solution of shock-bubble multiple interactions through reflecting walls. Front tracking method is applied to track the dynamic motion of the interface and FFT method is used to analyze the enstrophy changes during the process. Our results suggest that the enstrophy is a monotonically increasing function of the Mach number and the bubble radius when the density ratio of the two fluids inside and outside the bubble is fixed. Moreover from light-in/heavy-out to heavy-in/light-out, enstrophy is a monotonic function of the Atwood number. The analysis of these different cases provides a quantitative understanding about the vorticity generation in the turbulent mixing as a result of the Richtmyer-Meshkov instability induced by shock-contact interaction. We have also compared numerical solutions with and without tracking of the contact surface. The comparison shows that the untracked solution suffered substantial loss of enstrophy due to numerical diffusion.

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