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Surface tension effects on the evolution of interfaces in multimaterial compressible flows PEDRAM BIGDELOU, PRAVEEN RAMAPRABHU, University of North Carolina at Charlotte — We report on the effect of surface tension on the evolution of perturbed material interfaces in compressible multimedium flows. The level set method is used to track the interface, while the real Ghost Fluid Method[1] (rGFM) captures the interfacial coupling between the fluids. We implement these techniques in an in-house code IMPACT, designed for simulation of compressible flows with shocks and material interfaces. We present various test problems to address how surface tension affects the growth of perturbed interfaces driven by shocks. In particular, we examine surface tension effects on the baroclinically driven Richtmyer-Meshkov instability[2,3]. The 2D simulations were initialized with a sinusoidal perturbation imposed at the interface. An incident shock crosses the interface, followed by the growth of the imposed perturbation. The simulations were conducted at different values of the surface tension, and the variation in the instability growth rate was compared with recently proposed models. [1]Wang C.W., Liu T.G., Khoo B.C., SIAM J. Sci. Comput. 28(1) (2006) 278-302. [2]Richtmyer R.D., Commun. Pure Appl. Math. 13 (1960) 297-319. [3]Meshkov E.E., Fluid Dyn. 4 (1969) 101-104.

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