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Numerical Simulations of the turbulent Richtmyer-Meshkov instability in a spherically convergent geometry[1] ISMAEL DJIBRILLA BOUREIMA, PRAVEEN RAMAPRABHU, University of North Carolina at Charlotte — We investigate the development of the turbulent Richtmyer-Meshkov instability in a spherically convergent geometry. The three-dimensional simulations were performed using the astrophysical FLASH code [1], with a resolution of 1024 x 512 x 512 in the radial, azimuthal and polar directions for the multimode case. We present results from two sets of simulations, namely a spherical RM driven by a self-similar Chisnell [2] shock and an implosion problem defined by [3]. In both configurations, the shock travels from an outer fluid layer to an inner fluid that is denser. The implosion problem produces significantly greater convergence than the standard RM problem, allowing for significant enhancement of the turbulent mixing zone due to Bell-Plesset effects. We report on several quantities of interest from both simulations.

[1] Fryxell, B. et al., Astrophys. J. Suppl., 131 (1), 273 (2000).
[2] Chisnell, R. F, Proc. R. Soc. London, Ser. A, 232 (1955).
[3] Youngs, D. L., and Williams R. J., Intl. J Num. Meth. Fluids, 56 (8), 1597 (2008).

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