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Blast wave simulations on adaptively refined meshes: evaluating strategies for shock tube noise mitigation ASHWATH SETHU VENKATARAMAN, LOGAN KUNKA, NATHAN GADDIS, ELAINE ORAN, Texas A&M University — The large-scale blast and detonation research facility now being developed at Texas A&M University is centered on a 2m in diameter, 200 m long shock tube. One particular issue is that the noise level generated when the tube is fired must be low enough so that local residents are not disturbed. Here, we describe development of a new multidimensional, fully compressible, numerical model that will be used to compute sound levels and evaluate methods of sound mitigation. The model is based on the previously well tested flux-corrected transport algorithm for high-fidelity fluid dynamics calculations coupled with the AMReX software framework for block-structured adaptive mesh refinement. Results from the simulations are compared with other models and actual scale experiments. In particular, the results are compared with noise levels generated from simulations of a detonation tube and actual sound measurements generated by a modified 3-inch M1902 field gun.

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