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Dynamic Phase Boundaries for Compressible Fluids TIANSHI LU, ZHILIANG XU, ROMAN SAMULYAK, Brookhaven National Laboratory, JAMES GLIMM, Stony Brook University — We present an algorithm for the simulation of dynamic phase transitions in compressible fluids. The transition is modeled as a tracked jump discontinuity; the mass, momentum, and energy conservation laws across the phase boundary are solved as a generalized Riemann problem; the phase transition rate is associated with the deviation from phase equilibrium by the kinetic theory. The emphasis here is on the coupling of the phase transition process to acoustic waves, which is required for the study of cavitation induced by strong rarefaction waves. The robustness of the proposed algorithm is verified by application to various physical regimes.

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