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An inviscid regularization technique for the simulation of compressible multiphase flow BAHMAN ABOULHASANZADEH, KAMRAN MOHSENI, University of Florida — A common feature of flow problems involving shocks, turbulence, and/or two-phase flows is the k-infinity irregularity. We present an inviscid regularization technique, dubbed observable regularization, for the simulation of compressible multiphase flows. In this technique, we use the observable divergence theorem to derive the conservation equations considering the observability limit in any computational or physical system. To avoid contamination of the result with numerical diffusion a pseudo-spectral technique is used to discretize the conservation equations. This methodology has been tested successfully for regularizing single-phase problems with shocks and/or turbulence. Using observable Euler equations, shock-bubble and shock-drop interactions are simulated and the results are compared with available experimental data from literature, showing good agreement. Observable equations are capable of simultaneously regularizing problems with shocks, turbulence, and/or sharp interfaces without the need for treating each aspect separately.

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