

Fri1.3

Cheng & Cranfill

Using the green's function method to calculate pressure fluctuations in compressible multifluids

Baolian Cheng & Charles W. Cranfill

Los Alamos National Laboratory

bcheng@lanl.gov

In this paper, we present a pressure equation describing fluctuations in a turbulent mixing layer between two fluids. In the comoving frame of the mixing layer, the pressure fluctuation satisfies a decaying wave equation that can be solved analytically using the Green's function method. The obtained 1-D analytic solution for pressure fluctuations across the mixing layer displays the desired features required by the BHR turbulence transport model. It is shown that the pressure fluctuations, generated by shocks or instabilities in the mixing region, decay exponentially away from the mixing layer. This new solution could provide a theoretical foundation for the current artificial nonlocal length-scale equation used in the BHR model. The solutions successfully reduce to the well known incompressible form in the limit of large sound speed.

PACS: 47.40, 52.35