

Numerical Studies of Two-Phase Detonation by Using Improved CESE method

D. L. Zhang

*State Key Laboratory of High Temperature Gas Dynamics, Institute of Mechanics, CAS,
15 Beisihuanxi Road, Haidian District, Beijing 100190, China*

*Corresponding author. Email: DLZhang@imech.ac.cn

Abstract: The gas-droplet detonation has very complex phenomena and characters. Until now they are studied mainly by experiments, because complex interactions between the two phases and chemical reactions make numerical simulations very difficult. In the paper, Numerical Studies of two-phase detonation have been performed by using an improved space-time Conservation Element and Solution Element (CE/SE) method. The Eulerian model and Eulerian-Lagrangian Model were adopted already. Numerical results were compared with some experiments and characters of gas-droplet two-phase detonation were analyzed. All of them show that the complex phenomena of complex two-phase detonation can be simulated. The improved CE/SE scheme has the features of high resolution, simple form and robustness.

Keywords: gas-droplet two-phase fluid; detonation ; Chemical reactions; CESE method;