

# Towards a Simple and Robust Two-Phase Flow Algorithm

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## Abstract

In this work, the HLLC type Riemann solver is proposed for the resolution of the two-phase flows based on an Eulerian type mixture model with a non-conservative volume fraction model. The "stiffened" type Tammann equations of state are used to model the real fluids containing the gas and liquid particle materials. Several stiffened numerical test cases involve two-component air/liquid shock tubes under very high-density ratios and strong shock waves and contact surfaces. The current HLLC Riemann solver is demonstrated for its robustness on the capturing of the interfaces between two fluids with a density ratio up to 10000. In addition, the extension of the HLLC to solve a two-dimensional square bubble problem is displayed to highlight the simplicity and potential of the methods we propose.

Keyword : HLLC, two phase, interface capturing, mixture model