

Abstract Submitted
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A new Ghost Fluid Method for eliminating overheating errors in compressible multi-medium flows PEDRAM BIGDELOU, PRAVEEN RAMAPRABHU, CHEN LIU, PRASHANT TAREY, Univ of North Carolina - Charlotte — We describe a new version of the Ghost Fluid Method (GFM) called the Efficient GFM (EGFM), capable of eliminating overheating errors observed at fluid interfaces in compressible multi-medium flows. Earlier approaches, while mitigating overheating errors to some extent, have not been able to eliminate them completely. The proposed algorithm makes use of a lemma in [1] to apply the exact boundary conditions at the interface. In addition, the isentropic and shock relations proposed in [2] are applied to fix the density values near the interface, and are also extended here to address velocity corrections. The EGFM algorithm is validated using a wide array of 1D single- as well as multi-medium shock tube problems and shock-interface interactions, shock-bubble interaction problems and the Richtmyer-Meshkov instability. When compared with the original GFM approach and its subsequent variants, the EGFM scheme proposed here is robust, and has been demonstrated to result in highly accurate solutions. ¹L. Xu & T. Liu, *J. Comput. Phys.*, **230**, 4975 (2011). ²L. Xu, C. Feng & T. Liu, *Commun. Comput. Phys.*, **20(3)**, 619 (2016).

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