Asymptotically accurate high-order space and time schemes for the Euler system in the low Mach regime

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Résumé

In this communication, we present a second-order accurate and asymptotic preserving numerical method for the Euler system in the low Mach limit. First, we introduce the model and a first-order uniformly stable implicit-explicit (IMEX) numerical method which preserves the low Mach limit of the Euler system. Then, we consider a model advection equation and we develop a second-order strategy in the framework of the IMEX schemes, with specific limitation techniques to control the oscillations induced by the accuracy increase. Finally, we apply this strategy to the Euler system and we display several numerical results, thus highlighting the properties of the proposed scheme.

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