



On convergence of approximate solutions to the compressible Euler system

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Abstract

We consider a sequence of approximate solutions to the compressible Euler system admitting uniform energy bounds and/or satisfying the relevant field equations modulo an error vanishing in the asymptotic limit. We show that such a sequence either **(i)** converges strongly in the energy norm, or **(ii)** the limit is not a weak solution of the associated Euler system. This is in sharp contrast to the incompressible case, where (oscillatory) approximate solutions may converge weakly to solutions of the Euler system. Our approach leans on identifying a system of differential equations satisfied by the associated turbulent defect measure and showing that it only has a trivial solution.

Keywords Compressible Euler system · Convergence · Weak solution · Defect measure

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