

\mathcal{A} -free Rigidity and Applications to the Compressible Euler System

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In [4], Székelyhidi and Wiedemann showed that any measure-valued solution to the incompressible Euler equations in several space dimensions can be generated by a sequence of exact solutions. This means that measure-valued solutions and weak solutions are substantially the same for incompressible Euler, thus leading to a very large set of weak solutions.

In this talk we address the corresponding problem for the compressible Euler system: can every measure-valued solution to the compressible Euler equations be approximated by a sequence of weak solutions? We show that the answer is negative: generalizing a well-known rigidity result of Ball and James [1], we give an explicit example of a measure-valued solution for the compressible Euler equations which can not be generated by a sequence of distributional solutions. We also give an abstract necessary condition for measure-valued solutions to be generated by weak solutions, relying on work of Fonseca and Müller [3]. The dichotomy between weak and measure-valued solutions in the compressible case is in contrast with the incompressible situation. The results presented are joint work with E. Feireisl, O. Kreml and E. Wiedemann [2].

REFERENCES

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