Recent progress on smooth self-similar solutions to the compressible Euler equations

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I am going to discuss recent developments in singularity formation in the compressible Euler equations. In particular, I will focus on implosions, a phenomenon where a fluid concentrates at a point, resulting in the breakdown of the Euler equations. This process is modeled by self-similar solutions, whose generic mechanisms are known since the pioneering work done by Guderley in 1942 [1]. Despite this fact, we have recently lived a revival of the problem with the discovery and study of an unknown class of self-similar solutions (smooth profiles) [2,3,4] among the generic ones (non-smooth profiles) uncovered by Guderley 80 years ago. In this talk, I will discuss the differences between self-similar solutions in the 20th-century [1,5] and the 21st-century [2,3,4], as well as the differences in their stability analysis performed in [5] and [3], respectively.

Références

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