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Title: Stability problems in the theory of complete fluid systems

Abstract:

We discuss the issues related to general stability problem of the solution set to the Navier-Stokes-Fourier system of equations describing the evolution of a compressible, viscous and/or heat conducting fluid. We recall the concept of weak solutions based on the Second law of thermodynamics and introduce the relative energy functional.

Then we discuss some applications of this approach including:

(1) Singular limits and related problems

(2) Conditional regularity and relation to stability of certain numerical schemes

Finally, solvability of the inviscid variant of the problem are discussed including application of the theory of convex integration.