Energy balance on domains with and without boundaries

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Abstract

We consider the problem of energy balance for Leray–Hopf weak solutions of incompressible flows. In particular, we first study an inviscid inhomogeneous flow on the torus. An Onsager-type singularity result will be established for the energy conservation of weak solutions on the entire time interval including the initial time, provided certain Besov regularity on the velocity and the density. Such a result covers a wide range of rough density profiles. Next we discuss an extension of Onsager's conjecture for incompressible Navier–Stokes flows in domains with solid boundaries. We also prove a global energy balance under suitable regularity assumptions on the Leray–Hopf solutions. The talk concerns joint work with Zhilei Liang, Dehua Wang and Cheng Yu.