Karlsruhe Institute of Technology

Seminar of the Work Group
Nonlinear Partial Differential Equations
WS 25/26

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Seminar room: SR 3.069

Discontinuous Solutions of the 2D Compressible Navier-Stokes Equations with Variable Viscosity

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Abstract

In this talk, we consider the two-dimensional compressible Navier–Stokes equations, which model the evolution of a compressible fluid over time. The initial density is assumed to be regular on both sides of a regular curve, with possible discontinuities across this curve. This setting describes, for example, a mixture of two immiscible fluids. The goal is to prove the propagation of the piecewise regularity of the density function, as well as the regularity of the curve of discontinuities. In the first part of the talk, we discuss the general proof strategy found in the literature for the constant-viscosity case. In the second part, we present our result on regularity propagation in the variable-viscosity case and explain some of the underlying proof ideas.