

Seminar of the Work Group
Nonlinear Partial Differential Equations
WS 2020/21

Speaker: Zihui He
December 4, 2020, 14:00 - 15:30,
Zoom Link: <https://kit-lecture.zoom.us/j/7143665630>
Meeting ID: 714 366 5630

Solvability of the two-dimensional stationary incompressible inhomogeneous
Navier–Stokes equations with variable viscosity coefficient

Abstract

We will show the existence and some regularity properties of a class of weak solutions to the two-dimensional stationary incompressible inhomogeneous Navier–Stokes equations with variable viscosity coefficient. To establish these results, we analyze a fourth-order nonlinear elliptic equation for the stream functions. The density function and the viscosity coefficient can have large variations.

We will also give some explicit solutions for the parallel, concentric, and radial flows with piecewise constant viscosity coefficients, and their regularity properties will be discussed.

This talk is based on joint work with X. Liao.