

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

January 22, 2021, 14:00 - 15:30

Zoom Link: [//kit-lecture.zoom.us/j/7143665630](https://kit-lecture.zoom.us/j/7143665630)

Meeting ID: 714 366 5630

Computer-assisted Existence Proofs for Navier-Stokes Equations on an Unbounded Strip with Obstacle

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The incompressible stationary 2D Navier-Stokes equations are considered on an unbounded strip domain with a compact obstacle. Starting from an approximate solution (computed with divergence-free finite elements), we determine a bound for its defect, and a norm bound for the inverse of the linearization at the approximate solution. For the latter, bounds for the essential spectrum and for eigenvalues play a crucial role, especially for the eigenvalues “close to” zero. With these data in hand, we can use a fixed-point argument to obtain the existence of a solution “nearby“ the approximate one as well as an error bound (in a Sobolev space).