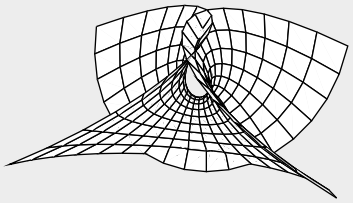

Einladung zum Oberseminar Mathematik in den Naturwissenschaften

Julius-Maximilians-Universität Würzburg
Lehrstuhl für Mathematik in den Naturwissenschaften

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Quantitative aspects on the ill-posedness of the Prandtl and hyperbolic Prandtl Equations

For more than a century, the Prandtl theory of boundary layers has inspired many scientific disciplines (from aerodynamics to plasticity and rheology). Although the Prandtl equations belong nowadays to the mathematical and physical folklore, the underlying solutions present however a particular unstable nature: from the result of Gérard-Varet and Dormy, the equations are ill-posed in any Sobolev spaces (when considering no structural assumptions on the flow). Around a suitable shear flow, Gérard-Varet and Dormy determined a suitable dispersion relation on the frequencies, which was interpreted later on as ill-posedness in a more general class of functions (the so-called Gevrey-classes m, $m > 2$).

This talk intends to present a recent result, obtained in collaboration with S. Scrobogna (University of Trieste) and J. Kortum (University of Würzburg). It illustrates how this common interpretation is in reality mathematically inaccurate: through a quantitative analysis of the instabilities and of the norm inflations, we showed how the result of Gérard-Varet and Dormy can be used momentarily only for the ill-posedness in Sobolev spaces and that the ill-posedness in Gevrey classes is still a mathematical open problem. We address furthermore some related problems for the ill-posedness of a meaningful extension of the Prandtl Equations.

Ort: Mathmatik Ost, 40.03.003/Zoom	Zeit: Donnerstag, 25.05.2023 um 10:15 Uhr

You are cordially invited to this lecture. Request the Zoom link from anja.schloemerkemper@mathematik.uni-wuerzburg.de

gez. Anja Schlömerkemper