



Seminar of the Work Group
Nonlinear Partial Differential Equations
SS 23

June 6th, 2023, 14:00 - 15:30
Seminar room: SR 3.068

Features of a Fractional Stokes-Transport system

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Abstract

In this talk, we will present two interesting features of a Stokes-transport system with a fractional viscosity law. This system, which is used as a model for understanding the sedimentation of a cloud of particles in a fluid, belongs to a large class of PDEs which are actively studied today: active scalar equations. After presenting the system, we will start by showing how the presence of gravity stratification affects the (possible) blow-up of solutions. This will take the form of an anisotropic criterion for detecting blow-up solutions. Secondly, we will see how uniqueness of solutions can be shown in a critical regularity setting. This last part will involve a discussion on the transport equation with non-Lipschitz coefficients.