

SALZBURG MATHEMATICS COLLOQUIUM

Summer 2022

Herbert Egger (Linz)

„Relative energy estimates for the stability and asymptotic analysis of nonlinear gas transport models“

June 30, 2022

Abstract:

Energy and relative energy estimates are a powerful tool for the analysis of nonlinear partial differential equations. After a brief introduction of the basic concepts, we study their application in the context of gas transport in long pipelines for which the dynamics are dominated by friction at the pipe walls. The governing equations are formulated as an abstract dissipative Hamiltonian system and relative energy estimates are employed to prove stability with respect to initial conditions and model parameters as well as quantitative perturbation estimates in the high friction limit. Our results are established in detail for the flow in a single pipe but through the energy-based modelling they naturally generalize also to pipe networks. Some further applications of relative energy estimates for discretization error analysis and other applications will be briefly discussed.

Thursday, **15:00-15:45**

Hörsaal 414, 1. Stock