Identification of non-linearities in transport-diffusion models of crowded motion

Martin Burger, <u>Jan-Frederik Pietschmann</u>, Marie-Therese Wolfram

Abstract:
The aim of this talk is to formulate a class of inverse problems of particular relevance in crowded motion, namely the simultaneous identification of entropies and mobilities. We study a model case of this class, namely the identification from flux-based measurements in a stationary setup. This leads to an inverse problem for a non-linear transportation diffusion model, where boundary values and possibly an external potential can be varied. In specific settings we provide a detailed theory for the forward map and an adjoint problem useful in the analysis and numerical solution. We further verify the simultaneous identifiability of the non-linearities and present several numerical tests yielding further insight on the way variations in boundary values and external potential affect the quality of reconstructions.