

Non-Local Conservation Laws for Material Flow Problems

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The material flow problems under consideration have a granular like structure and allow for a multi-scale model hierarchy. Starting from a detailed microscopic model based on Newton type dynamics, a corresponding macroscopic model is derived, leading to conservation laws with a non-local interaction term. Both modeling approaches are fitted against real data from an experimental setup. In addition to numerical simulation results and theoretical investigations, we address questions of optimal control and extensions to networks.