Universität Basel

Research Project

Continuity equations with non smooth velocity: quantitative estimates and applications to nonlinear problems

Third-party funded project

Project title Continuity equations with non smooth velocity: quantitative estimates and applications to nonlinear problems
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Organisation / Research unit
Departement Mathematik und Informatik / Analysis (Crippa)
Department
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We investigate well-posedness and further properties for the continuity equation and for the ordinary differential equation out of the classical smooth (Lipschitz regular) framework. The leading theme is the search for quantitative estimates: stability, compactness and regularity statements in which we give an explicit control of the quantities under analysis in terms of natural bounds on the data. This quantitative analysis allows us to study several applications to nonlinear partial differential equations: we address various questions about existence, continuity with respect to initial data, convergence of singular approximations and convergence of nonlocal approximations for the Euler equation, the Vlasov-Poisson equation, and the Burgers' equation. We investigate well-posedness and further properties for the continuity equation and for the ordinary differential equation out of the classical smooth (Lipschitz regular) framework.

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