Contractivity of Wasserstein metrics for scalar conservation laws

Marco Di Francesco - *University of L'Aquila*

The aim of this paper is to analyze contractivity properties of Wasserstein-type metrics for one-dimensional scalar conservation laws with nonnegative, L^1 and compactly supported initial data and its implications on the long time asymptotics. The flux is assumed to be convex and without any growth condition at the zero state. We propose a time-parameterized family of functions as intermediate asymptotics and prove the solutions, after a time-depending scaling, converge toward this family in the d_1-Wasserstein metric. This asymptotic behavior relies on the aforementioned contraction property for conservation laws in the space of probability densities metrized with the d_∞-Wasserstein distance. Finally, we also give asymptotic profiles for initial data whose distributional derivative is a probability measure.