Stability of Schrödinger potentials and application to PDEs

Maxime LABORDE, LJLL - Université Paris Cité

The function that maps a family of probability measures to the solution of the dual entropic optimal transport problem is known as the Schrödinger map. We prove that when the cost function is $\mathcal{C}^{k+1}$ with $k \in \mathbb{N}^{\star}$ then this map is Lipschitz continuous from the L^2-Wasserstein space to the space of $\mathcal{C}^k$ functions. Our result holds on compact domains and covers the multi-marginal case. As applications, we prove displacement smoothness of the entropic optimal transport cost and the well-posedness of certain Wasserstein gradient flows involving this functional, including multi-species system, and exponential convergence to the equilibrium. This work is in collaboration with G. Carlier and L. Chizat.

Contact : laborde@math.univ-paris-diderot.fr