Displacement smoothness of entropic optimal transport and applications

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Entropic optimal transport (EOT) has received a lot of attention in recent years due to its numerical tractability (Sinkhorn algorithm) as well as its connections to the Schrödinger bridge problem. In this talk, I will first give some Lipschitz dependence results for the potentials of EOT (in Ck norm) with respect to the marginals (for the Wasserstein metric). As a first application, well posedness for Wasserstein gradient flows (with possibly several species) of energies involving EOT terms will follow. Finally, I will describe another application which concerns the so-called semi geostrophic equation, which has an Hamiltonian structure, well-posedness and convergence of its entropic approximation will be explained (work in progress with Jean-David Benamou and Hugo Malamut).