

An entropic interpolation problem for incompressible viscid fluids

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Abstract. In view of studying incompressible inviscid fluids, Brenier introduced in the late 80's a relaxation of a geodesic problem addressed by Arnold in 1966. Instead of inviscid fluids, the talk will be devoted to incompressible viscid fluids. A natural analogue of Brenier's problem is introduced, where generalized flows are no more supported by absolutely continuous paths, but by Brownian sample paths. It turns out that this new variational problem is an entropy minimization problem with marginal constraints entering the class of convex minimization problems. The talk will explore the connection between this variational problem and Brenier's original problem. Its dual problem is derived and the general shape of its solution is described. Under the restrictive assumption that the pressure is a nice function, the kinematics of its solution is made explicit and its connection with the Navier-Stokes equation is established.