

Discretization of the incompressible Euler equation: a Lagrangian approach based on semi discrete optimal transport

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We approximate the regular solutions of the incompressible Euler equation by flows of ODEs taking values in finite-dimensional spaces. This approach à la Brenier relies on the one hand on Arnold’s interpretation of the Euler equation as geodesics in the space of measure-preserving diffeomorphisms, and on the other hand on the semi-discrete Optimal Transport. This approach is naturally associated with a numerical scheme, which will be shown to converge towards regular solutions of the incompressible Euler equation.

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