

# On global stability of optimal rearrangement maps

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## Abstract

We study the nonlocal vectorial transport equation  $\partial_t y + (\mathbb{P}y \cdot \nabla)y = 0$  on bounded domains of  $\mathbb{R}^d$  where  $\mathbb{P}$  denotes the Leray projector. This equation was introduced to obtain the unique optimal rearrangement of the initial map  $y_0$  as its steady states. We rigorously justify this expectation by proving that for initial maps  $y_0$  sufficiently close to maps with strictly convex potential, the solutions  $y$  are global in time and converge exponentially fast to the optimal rearrangement of  $y_0$  as time tends to infinity. This is joint work with T. Nguyen (Penn. State).

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