1086-35-497 **Otis Chodosh**, **Vishesh Jain** (visheshj@stanford.edu), **Michael Lindsey**, **Lyuboslav Panchev*** (lpanchev@stanford.edu) and **Yanir A. Rubinstein**. *On the discontinuity of optimal transportation maps.*

Consider two bounded domains Ω and Λ in R^2, and two sufficiently regular probability measures μ and ν supported on them. By Brenier's theorem, there exists a unique optimal transportation map T satisfying $T_{\#}\mu = \nu$ and minizing the quadratic cost $\int_{R^n} |T(x) - x|^2 d\mu(x)$. Furthermore, by Caffarelli's regularity theory for the real Monge–Ampère equations (1990's) if Λ is convex, T is continuous. We study the converse problem, namely: how discontinuous is the map T when Λ fails to be convex? We prove a number of results relating the geometry of Λ to the (dis)continuity of T. The main idea is to use tools of convex analysis and the extrinsic geometry of $\partial\Lambda$ to distinguish between Brenier and Alexandrov weak solutions of the Monge–Ampère equation. (Received September 05, 2012)