

1127-35-108

**Jun Kitagawa\*** (kitagawa@math.msu.edu) and **Robert J McCann**. *Free singularities in optimal transport.*

On  $\mathbb{R}^n$ , with the choice of cost function given by Euclidean distance squared, an optimal transport map from a connected set to a disconnected set must have discontinuous points. In this talk I will discuss finer structure of this set of “free singularities.” Specifically, if the connected components of the support of the target measure are suitably separated by hyperplanes, this singular set will consist of DC (difference of convex) hypersurfaces of appropriate codimensions. We prove this result via a non-smooth implicit function theorem for convex functions, which is of independent interest. Time permitting, I will also talk about another application of this implicit function theorem, in a stability result for singular sets. (Received January 26, 2017)