A geometric study of Wasserstein spaces: Euclidean spaces

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Abstract. In this article we consider Wasserstein spaces (with quadratic transportation cost) as intrinsic metric spaces. We are interested in usual geometric properties: curvature, rank and isometry group, mostly in the case of Euclidean spaces. Our most striking result is that the Wasserstein space of the line admits "exotic" isometries, which do not preserve the shape of measures.