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*Least Wasserstein Distance Between Disjoint Shapes With Perimeter Regularization*

We prove the existence of global minimizers to the double minimization problem

$$\inf \left\{ P(E) + \lambda W_p(\mathcal{L}^n \llcorner E, \mathcal{L}^n \llcorner F) : |E \cap F| = 0, |E| = |F| = 1 \right\},$$

where  $P(E)$  denotes the perimeter of the set  $E$ ,  $W_p$  is the  $p$ -Wasserstein distance between Borel probability measures, and  $\lambda > 0$  is arbitrary. The result holds in all space dimensions, for all  $p \in [1, \infty)$ , and for all positive  $\lambda$ . This answers a question of Buttazzo, Carlier, and Laborde.