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**Facundo Memoli\*** ([memoli@math.stanford.edu](mailto:memoli@math.stanford.edu)), Stanford University, Mathematics Department, Building 380, Sloan Hall, Stanford, CA 94305. *A spectral notion of Gromov-Wasserstein distances.*

We introduce a spectral notion of distance between shapes (closed Riemannian manifolds) and study its theoretical properties. We show that our distance satisfies the properties of a metric on the class of isometric shapes, which means, in particular, that two shapes are at 0 distance if and only if they are isometric. Our construction is similar to the Gromov-Wasserstein distance, but rather than viewing shapes as metric spaces, we define our distance via the comparison of heat kernels. This is possible since the heat kernel characterizes the shape up to isometry. By establishing two different hierarchies of lower bounds, we relate our distance to previously proposed spectral invariants used for shape comparison, such as the spectrum of the Laplace-Beltrami operator and statistics of pair-wise diffusion distances. Lower bounds in these hierarchies provide increasing discriminative power at the expense of more involved computations. (Received September 07, 2009)