

Optimal transport and coupled diffusion by reflection

Kazumasa Kuwada (Ochanomizu University)

This talk is based on an ongoing joint work with Karl-Theodor Sturm. On Riemannian manifolds with a lower Ricci curvature bound in the Bakry-Émery sense, we show that a Kendall-Cranston type coupling by reflection of diffusion processes yields a monotonicity in time of a time-inhomogeneous optimal transportation cost between two diffusions. As an analogous result, a coupling by parallel transport was known to yield a monotonicity of time-scaled L^p -Wasserstein distance. Similar to that case, our cost function is also a function of the distance function, but it is concave unlike p -th power function. This new monotonicity property is also related with a gradient estimate of the diffusion semigroup as Kendall-Cranston couplings are. In addition, it is stable under the (Gromov-Hausdorff) convergence of underlying spaces and diffusions with uniform lower Ricci curvature bounds.