

Stochastic optimal transport with at most quadratic growth cost

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In this talk, we consider a class of stochastic optimal transport, SOT for short, with given two endpoint marginals in the case where a cost function exhibits at most quadratic growth. We first give the upper and lower estimates, the short- and long-time asymptotics, and the zero-noise limits of SOT. As a by-product, we characterize the finiteness of the value function of SOT by that of the Monge–Kantorovich problem with the same two endpoint marginals. As an application, we show the existence of a continuous semimartingale, with given initial and terminal distributions, of which the drift vector is r th integrable for $r \in [1, 2)$. We also show that the value function of SOT is equal to zero or infinity in the case where a cost function exhibits less than linear growth. We discuss the same problem for Schrödinger’s problem where $r = 2$. This paper is a continuation of our previous work.