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A Theory of Transfers

I will introduce the class of "linear transfers" between probability measures. This class contains all cost minimizing mass transports, including "martingale mass transports". It also contain the "Schrodinger bridge" associated to a reversible Markov process, and the "weak mass transports" of Talagrand, Marton, Gozlan and others. However, what motivated us to develop the concept are the stochastic mass transports in their various forms. We also introduce the cone of "convex transfers," which in addition to linear transfers, include any p-power of a linear transfer, but also the logarithmic entropy, other correlations functionals, as well as the Donsker-Varadhan information. The ultimate goal: Stochastic Weak KAM theory.