A land of monotone plenty

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Abstract. A fundamental concept in optimal transport is c-cyclical monotonicity: it allows to link the optimality of transport plans to the geometry of their support sets. Recently, related concepts have been successfully applied in the multi-marginal version of the transport problem as well as in the martingale transport problem which arises from model-independent finance.

We establish a unifying concept of *c-monotonicity/finitistic optimality* which describes the geometric structure of optimizers of a generalized moment problem. This allows us to strengthen known results in optimal martingale transport and for a transport problem with a continuum of marginals.

If the optimization problem can be formulated as a multi-marginal transport problem, potentially with additional linear constraints, our contribution is parallel to a recent result of Zaev.

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