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Title: Finite-range kernel decompositions and asymptotic Optimal Transport between configurations

Abstract: Consider the N-marginal optimal transport problem between N equal probability measures on $\mathbb{R}^d$, in which the transport cost between N points equals $\sum_{i \neq j} |x_i - x_j|^{-s}$ with $0 < s < d$. This problem represents a link between the study of ground states for classical and quantum gases.

We prove the sharp large-N asymptotics for the above N-marginal transport problem beyond the mean-field continuum limit. To this aim we establish a general finite-range decomposition technique to split the kernel into positive-definite contributions. This decomposition seems interesting in itself and may have further applications.