

# INEQUALITIES OF THE PARAMETERIZED WASSERSTEIN MEAN OF POSITIVE DEFINITE MATRICES

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## ABSTRACT

From an optimization problem for the sandwiched quasi-relative entropy (the parameterized version of fidelity), a new parameterized matrix mean on the cone of positive definite matrices has been recently introduced. This mean generalizes the well-known Wasserstein mean (the least squares mean for the Bures-Wasserstein metric), so we call it the parameterized Wasserstein mean. We see in this talk several interesting properties of the parameterized Wasserstein mean including the determinantal inequality and bounds for the Loewner order and operator norm. Furthermore, we find relationships of the parameterized Wasserstein mean with other matrix means and show the majorization property with the Cartan mean (the least squares mean for the Riemannian trace metric).

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