INEQUALITIES FOR CERTAIN POWERS OF SEVERAL POSITIVE DEFINITE MATRICES

FADI ALRIMAWI

Abstract. Let $A_i, i = 1, \ldots, m$, and $X$ be $n \times n$ matrices such that each $A_i$ is positive definite with $0 < a_i \leq s_n(A_i)$ and $X$ is Hermitian. Then it is shown that

$$\left\| \left( \sum_{i=1}^{m} A_i^{a_{m+1-i}} \right) X + X \left( \sum_{i=1}^{m} A_i^{a_{m+1-i}} \right) \right\| \geq m(1 + l^2) \|X\|,$$

for every unitarily invariant norm, where $l = \min_{1 \leq i \leq m} a_i$.


Keywords and phrases: Convex function, positive definite matrix, Hermitian matrix, singular value, unitarily invariant norm, inequality.

REFERENCES