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Matrix Means and Uncertainty Principle Functions

An *Uncertainty Principle Function* (UPF) is a function $F_\rho(A, B)$ such that

$$\mathrm{Var}_\rho(A)\mathrm{Var}_\rho(B) - |\Re(\mathrm{Cov}_\rho(A, B))|^2 \geq F_\rho(A, B).$$

In this talk, we show that when σ is a Kubo-Ando mean such that $\sigma > \sharp$, there exists a class of operators for which

$$F_\rho(A, B) := \mathrm{Var}_\rho(A)\mathrm{Var}_\rho(B) - \mathrm{Var}_\rho(A\sigma B)^2$$

is a UPF. Time permitting, we will look at several related trace inequalities.