DAVID CRUZ-URIBE, The University of Alabama

Sharp constant estimates for matrix weighted inequalities

In this talk we will review some recent work on strong (p,p) and weak $(1,1)$ inequalities with matrix weights: e.g., inequalities of the form

$$\int_{\mathbb{R}^n} |W^{1/p}(x)T\mathbf{f}(x)|^p\,dx \leq C\int_{\mathbb{R}^n} |W^{1/p}(x)\mathbf{f}(x)|^p\,dx,$$

$$|\{x\in\mathbb{R}^n : |W(x)T(W^{-1}\mathbf{f})(x)| > t\}| \leq \frac{C}{t}\int_{\mathbb{R}^n} |\mathbf{f}(x)|\,dx.$$

W is an $n\times n$ self-adjoint, positive semi-definite matrix that satisfies the matrix A_p condition, and T is a Calderón-Zygmund operator. We will also mention results for the Golderg maximal operator and commutators. We will conclude with some open questions in both the scalar and matrix weighted cases.

This is joint work with Kabe Moen, Josh Isralowitz, Sandra Pott and Israel Rivera-Rios.