1117-42-397 **David V. Cruz-Uribe*** (`dcruzuribe@ua.edu`), Department of Mathematics, University of Alabama, Box 870350, Tuscaloosa, AL 35487. *Weighted norm estimates in variable Lebesgue spaces.*

The variable Lebesgue spaces $L^{p(\cdot)}$ are a generalization of the classical Lebesgue spaces: intuitively, they consist of functions f such that

$$\int |f(x)|^{p(x)}\,dx < \infty$$

for a fixed exponent function $p(\cdot)$. We are interested in extending the theory of Muckenhoupt weights to the variable Lebesgue spaces. In this setting the correction condition is $w \in A_{p(\cdot)}$:

$$\sup_Q \|w\chi_Q\|_{L^{p(\cdot)}}\|w^{-1}\chi_Q\|_{L^{p'(\cdot)}} < \infty.$$

With minimal regularity assumptions on the exponent $p(\cdot)$, Fiorenza, Neugebauer and I showed that the Hardy-Littlewood maximal operator satisfies

$$\|(Mf)w\|_{L^{p(\cdot)}} \leq C\|fw\|_{L^{p(\cdot)}}.$$

In more recent work with D. Wang, we showed that this yields a Rubio de Francia extrapolation theorem for variable Lebesgue spaces. As a consequence we immediately get norm inequalities for the classical operators of harmonic analysis. We have also explored the structural theory for $A_{p(\cdot)}$ weights. In this talk we will review this work and then discuss open questions related to the sharp exponent problem in the variable Lebesgue spaces. (Received January 18, 2016)