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**Maria Cristina Pereyra\*** ([crisp@math.unm.edu](mailto:crisp@math.unm.edu)), Department of Mathematics and Statistics, MSC03 2150, 1 University of New Mexico, Albuquerque, NM 87131, and **Carlos Perez** and **DaeWon Chung**. *Sharp bounds for commutators on weighted Lebesgue spaces.*

In this talk we present optimal bounds for the commutator of singular integral operators and  $BMO$  functions. We show that if the operator bound in  $L^2(w)$  is linear with respect to the  $A_2$ -characteristic of the weight  $w$ , then its commutator's operator bound must be at least quadratic with respect to the  $A_2$ -characteristic of the weight. Extrapolation then gives bounds in weighted  $L^p(w)$ . The results are sharp for all  $1 < p < \infty$ , and all dimensions as examples (Hilbert, Riesz and Beurling transforms) show. Note that the commutator itself is not a CZ singular integral operator (it is not of weak type (1,1) for example). (Received August 08, 2010)