1063-42-201 **Carlos Perez*** (carlosperez@us.es), University of Seville, Seville, Spain. *Around the A2 conjecture for singular integral operators.*

Around the A_2 conjecture for singular integral operators.

We plan to give a brief survey on some recent results concerning the boundedness of singular integrals on weighted L^2 spaces with sharp operator bounds.

In the first part of this lecture (joint work with D. Cruz-Uribe and J. M. Martell) we will discuss a new proof of the linear sharp weighted L^2 estimate

$$\|T\|_{L^2(w)} \leq c_{n,T}\,[w]_{A_2}$$

where $w \in A_2$ and T is the Hilbert transform, a Riesz transform, the Beurling-Ahlfors operator or any operator that can be approximated by Haar shift operators which avoids the Bellman function technique and any two weight norm inequalities. The method can be applied to obtain similar sharp results for other important operators such as the dyadic square function, paraproducts or the vector-valued maximal function.

In the second part (joint work with S. Treil and A. Volberg) of the lecture we will discuss some recent progress of the A_2 conjecture for any Calderón-Zygmund operator. In particular we show that everything is reduced to consider the corresponding weighted weak L^2 estimate. (Received August 16, 2010)