

“Multilinear Harmonic Analysis: recent results”

Carlos Pérez

“Universidad de Sevilla (and University of Kansas)”

In this talk we plan to give a survey of some results concerning Multilinear Harmonic Analysis related to Calderón-Zygmund Singular Integrals. We will review first some of the basics of the classical linear theory. We will show then that these Multilinear Singular Integral Operators are controlled by a multilinear analog of the classical Hardy-Littlewood maximal function given by

$$\mathcal{M}(f_1, \dots, f_m)(x) = \sup_{x \in Q} \prod_{i=1}^m \frac{1}{|Q|} \int_Q |f_i(y_i)| dy_i.$$

From this we build an appropriate multilinear \vec{A}_p theory of weights for these Multilinear Singular Integral Operators.

After reviewing again the classical theory, we will also consider commutators of these Multilinear Singular Integrals with B.M.O. functions and show the sharp multilinear end-point estimate. There are also strong type estimates whose proof show the relationship with another multilinear maximal function

$$\mathcal{M}_{L(\log L)}(f_1, \dots, f_m)(x) = \sup_{x \in Q} \prod_{j=1}^m \|f_j\|_{L(\log L), Q}.$$