

1037-35-1

Zhongwei Shen* (zshen2@email.uky.edu), Department of Mathematics, University of Kentucky, Lexington, KY 40506. *The Celerated Calderón-Zygmund Lemma Revisited.*

The celerated Calderón-Zygmund Lemma played a key role in the real variable analysis of singular integrals. Classical applications of the Calderón-Zygmund theory include the $W^{2,p}$ estimates for the elliptic equation $\Delta u = f$ and the L^p boundedness of the Riesz transforms $\nabla(-\Delta)^{-1/2}$ for $1 < p < \infty$. However, as the coefficients of differential equations or the underlined domains of boundary value problems become less smooth, the operators involved are often not bounded on very L^p spaces. In this talk we will describe a new real variable method that can be applied in many situations where L^p estimates are expected only for limited ranges of p 's. We will illustrate such applications in the study of boundary value problems in nonsmooth domains for elliptic systems and higher-order elliptic equations, and of Riesz transforms associated with second order elliptic operators with bounded measurable coefficients. (Received January 25, 2008)