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**0992.46021****Bastero, Jesús; Milman, Mario; Ruiz, Francisco J.****On the connections between weighted norm inequalities, commutators and real interpolation.** (English)

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A theory of weighted norm inequalities for classical operators has been developed in recent years. We mention the celebrated theory of Muckenhoupt for the maximal operator of Hardy-Littlewood. In the first part of this interesting paper the authors show that the class of weights that controls the weighted  $L^p$  estimates for the Calderon operator can be used to develop a rich theory of interpolation which includes some novelties in comparison to classical theory of Lions-Peetre. These weights, called Calderon weights are studied in section 2. An application of these weights to a general extrapolation theorem of type Rubio de Francia is given in section 3. (See Thm. 3.10.) Also some other classes of weights are considered in section 4 and the application to a more general extrapolation theorem is given in section 5. Applications to some function spaces are given in section 6 and in section 7 are considered commutators defined by the  $K$ -method. Also an extension of this last notion is studied thoroughly in section 8. The quasi-Banach case of the theory is considered in section 9. Some applications to harmonic analysis, particularly to commutator theorems with multiplication operators, are considered in section 10. Finally BMO type spaces associated to Calderon weights are studied in section 11 and its preduals are introduced in section 12.

In my opinion this paper is an important one for all working at the frontier between interpolation theory and harmonic analysis.

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*Keywords* : Calderon operator; weighted norm inequalities; interpolation of operators; commutators; BMO; maximal operator; Calderon weights; extrapolation theorem;  $K$ -method

*Classification* :

- \*46E30 Spaces of measurable functions
- 46B70 Interpolation between normed linear spaces
- 42B20 Singular integrals, several variables
- 46M35 Abstract interpolation of topological linear spaces
- 46E35 Sobolev spaces and generalizations

Cited in ...