DEPARTAMENTO DE ANÁLISIS MATEMÁTICO Y MATEMÁTICA APLICADA

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COLLOQUIUM DE ANÁLISIS MATEMÁTICO

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A Sharp form of the Marcinkiewicz Interpolation Theorem for Orlicz spaces

An important special case of the classical Marcinkiewicz interpolation theorem asserts that a quasilinear operator defined on a space of simple functions on a measure space (X, μ) and taking values in the space of measurable functions on measure space (Y, ν), which is of weak-type (p0, p0) and (p1, p1), is bounded from Lp(X, μ) to Lp(Y, ν) for p0 < p < p1. This theorem has been extended to include various important generalizations. We, in particular, focus on the work of Zygmund-Str¨omberg (1956, 1975), A. Cianchi (1998, 1999) and R. Kerman et al. (2014), that extends this theorem to a special class of Banach function spaces, namely, Orlicz spaces. In this talk, we build on these authors' work and consider a version of the Marcinkiewicz interpolation theorem for the class, W((p0, r0),(p1, r1); μ, ν), of quasilinear operators that map Lorentz space Lp0,r0 (X, μ) into Lp0,∞(Y, ν) and Lp1,r1 (X, μ) into Lp1,∞(Y, ν), $1 \leq p0 < p1 < \infty$, $1 \leq r0, r1 < \infty$. We give necessary and sufficient conditions for such operators to be bounded from Orlicz space, $L\Phi 2$ (X, μ), to Orlicz space, $L\Phi 1$ (Y, ν).

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