

RdF Extrapolation without RdF

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Abstract

We present a multi-variable extension of Rubio de Francia's restricted weak-type extrapolation theory that does not involve Rubio de Francia's iteration algorithm; instead, we rely on the following mixed weak-type inequality for the weighted Hardy-Littlewood maximal operator:

$$\left\| \frac{M_u(fv)}{v} \right\|_{L^{1,\infty}(uv)} \leq C_{u,v} \|f\|_{L^1(uv)}, \quad u, uv \in A_\infty.$$

Our approach can be adapted to recover the recently developed weak-type $A_{\vec{p}}$ extrapolation and an endpoint result that falls outside the classical theory. We also discuss possible applications and open questions.