

Recent advances on the one-sided weight theory on higher dimensions

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In this talk we present an example showing that the natural variant of a one-sided Fefferman-Stein inequality for M^+ fails in dimension three. In fact, we will show something even stronger. We construct a weight w such that $M^-w(x) \leq Cw(x)$ a.e. $x \in \mathbb{R}^3$, yet the weak-type $(1,1)$ inequality for M^+ with respect to the weight w does not hold. On the other hand, as a positive result, we obtain that the condition $M_s^-w(x) \leq Cw(x)$ ($s > 1$) a.e. $x \in \mathbb{R}^n$ is indeed sufficient for the weighted weak-type $(1,1)$ inequality of M^+ in any dimension. This talk is based on joint work with F. Nazarov.

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