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Antti Vähäkangas, University of Jyväskylä
Abstract

BEYOND LOCAL MAXIMAL OPERATORS

We consider the following generalization of a local maximal operator:

$$M_R(f)(x) = \sup_r \fint_{B(x,r)} |f(y)|\,dy\,, \quad x \in G\,,$$

where the supremum is taken over all $0 < r \leq R(x) \leq \operatorname{dist}(x, \partial G)$ and R is a measurable function on an open set $G \subset \mathbb{R}^n$. I will discuss a boundedness result for the operator M_R between fractional Muckenhoupt weighted Sobolev spaces and their R-modifications. Some applications (involving neighbourhood capacities and Lebesgue points of fractional weighted Sobolev functions) are presented.

The talk is based on a joint work with H. Luiro (University of Jyväskylä).