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Embedding of Calderón-Kolyada classes C_η^p in $\varphi(L)$

The Calderón-Kolyada class C_η^p consists of functions $f \in L^p(X)$, such that the maximal function

$$\sup_{B \ni x} \frac{1}{\eta(r_B)} \fint_B |f - f(x)| \, d\mu$$

belongs to $L^p(X)$, where X is a metric measure space. In the talk we discuss the conditions on the positive increasing function $\varphi(0, \infty) \to (0, \infty)$, under which the following integral

$$\int_X \varphi(f) \, d\mu$$

is finite for any function from C_η^p.