Chikvinidze, L. N.

On an analog of the Muckenhoupt condition in domains with a quasiconformal boundary.

(Russian. English summary) Zbl 0706.30015
Tr. Tbilis. Mat. Inst. Razmadze 88, 41-58 (1989).

[For the entire collection see Zbl 0676.00013.]

Let w be a nonnegative measurable function in a bounded Jordan domain G with quasiconformal boundary Γ. Let g be a quasiconformal reflection in Γ. Let T denote the operator defined by

$$Tf(z) = -\frac{1}{\pi}\iint_G \frac{f(\zeta)g_\xi(\zeta)}{(g(\zeta)-z)^2}d\sigma(\zeta), \quad z \in G,$$

where $f \in L_p(G,w) := \{f$ is measurable in G and $\iint_G |f|^p w d\sigma < \infty\}$, $d\sigma$ denoting the Lebesgue measure on $\mathbb{C}$.

Main result: If $p > 1$ then there is a positive constant c_p such that

$$\iint_G |Tf(z)|^p d\sigma(z) \le c_p \iint_G |f(z)|^p w(z) d\sigma(z), \quad f \in L_p(G,w)$$

if and only if

$$(\frac{1}{|Q|}\iint_{Q\cap G} w d\sigma)(\frac{1}{|Q|}\iint_{Q\cap G} w^{-1/(p-1)}d\sigma)^{p-1} < cconst$$

for every square $Q = [x-a, x+a] \times [y-a, y+a]$ with $z = x+iy \in \Gamma$ and $a > 0$.

Reviewer: J.Siciak

MSC:

30C62 Quasiconformal mappings in the complex plane

Keywords:

weighted norm inequalities; quasiconformal boundary; quasiconformal reflection