LOCAL GRADIENT ESTIMATES FOR THE $p(x)$–LAPLACIAN ELLIPTIC EQUATIONS

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Abstract. In this paper we give a new and direct proof of local $L^q$ estimates for the non-homogeneous $p(x)$-Laplacian elliptic equation under some proper conditions on $p(x) > 1$. We prove that
\[ |f|^{p(x)} \in L^q_{\text{loc}} \implies |\nabla u|^{p(x)} \in L^q_{\text{loc}} \quad \text{for any } q \geq 1 \]
for weak solutions of
\[ \text{div} \left( |\nabla u|^{p(x) - 2} \nabla u \right) = \text{div} \left( |f|^{p(x) - 2} f \right) \quad \text{in } \Omega. \]


Keywords and phrases: Regularity, $L^q$, divergence, quasilinear, elliptic, $p(x)$-Laplacian.

REFERENCES


