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WEIGHTED MORREY A PRIORI ESTIMATES FOR POISSON EQUATION

Abstract

Let Ω a bounded domain in \mathbb{R}^n with $\partial\Omega \in C^2$ and let u be a solution of the classical Poisson problem in Ω ; i.e.,

$$\begin{cases} -\Delta u = f & \text{in } \Omega, \\ u = 0 & \text{on } \partial\Omega, \end{cases}$$

where $f \in M_{p,\kappa}(\Omega, w)$, $1 \leq p < \infty$, $0 \leq \kappa < 1$ and w is a weight in A_p .

The main goal of this paper is to prove the following a priori estimate

$$\|u\|_{W_{p,\kappa}^2(\Omega, w)} \leq C \|f\|_{M_{p,\kappa}(\Omega, w)},$$

and to give some applications for weights given by powers of the distance to the boundary.