Integrability results for solutions to equations of n–Laplacian type

Luigi D'Onofrio*

* University of Napoli Parthenope, Italy
E-mail: luigi.donofrio@uniparthenope.it

This work establishes sharp integrability results for local solutions to quasi-linear elliptic equations of n-Laplacian type in bounded domains $\Omega \subset \mathbb{R}^n$ with $n \geq 2$. We consider the general equation

$$-\text{div } a(x, \nabla u) = f \quad \text{in } \Omega,$$

where the vector field $a : \Omega \times \mathbb{R}^n \to \mathbb{R}^n$ satisfies Carathéodory conditions with monotonicity and growth assumptions. The model case is the n-Laplacian operator with coefficients:

$$-\text{div } \big(b(x)|\nabla u|^{n-2}\nabla u\big) = f \quad \text{in } \Omega,$$

where $0 < \nu \leq b(\cdot) \leq L < \infty$.