ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

10. Partial Differential Equations

1991 MS Classification: 35J65

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The p-Laplacian under mixed boundary value conditions in multidimensional polyhedral domains.

The equation $-\mathrm{div}(|\nabla u|^{p-2}\nabla u) = f$ is considered on a bounded polyhedral domain $\Omega \subset \mathbb{R}^n$, where $n \geq 3$. Mixed Dirichlet-Neumann boundary conditions are given. Thus, the solution u may have singularities on the boundary.

Using a difference quotient technique, we prove that $u \in W^{s,p}(\Omega)$ for $s < \frac{3}{2}$. This generalizes the known results for the case when $p = 2$.

Reference: C. Ebmeyer and J. Frehse, Mixed boundary value problems for nonlinear equations in multidimensional non-smooth domains, (to appear).