

A STABILITY RESULT FOR NONLINEAR NEUMANN PROBLEMS IN REIFENBERG FLAT DOMAINS IN \mathbb{R}^N

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Abstract

In this paper we prove that if Ω_k is a sequence of Reifenberg-flat domains in \mathbb{R}^N that converges to Ω for the complementary Hausdorff distance and if in addition the sequence Ω_k has a “uniform size of holes”, then the solutions u_k of a Neumann problem of the form

$$(0.1) \quad \begin{cases} -\operatorname{div} a(x, \nabla u_k) + b(x, u_k) = 0 & \text{in } \Omega_k \\ a(x, \nabla u_k) \cdot \nu = 0 & \text{on } \partial\Omega_k \end{cases}$$

converge to the solution u of the same Neumann problem in Ω . The result is obtained by proving the Mosco convergence of some Sobolev spaces, that follows from the extension property of Reifenberg-flat domains.

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Key words. Boundary value problems, nonlinear elliptic equations, Hausdorff distance, Reifenberg-flat sets, Mosco convergence.