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

\begin{align*}
-\text{div} a(x, \nabla u_k) + b(x, u_k) &= 0 \quad \text{in } \Omega_k \\
\left(a(x, \nabla u_k) \cdot \nu\right) &= 0 \quad \text{on } \partial \Omega_k
\end{align*}

converge to the solution $u$ of the same Neumann problem in $\Omega$. 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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