

Insulating Layers and Robin Problems on Koch Mixtures

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Abstract

This paper deals with a reinforcement problem for a plane domain $\Omega^{(\xi)}$ whose boundary is a deterministic or random “mixture” of self-similar Koch curves.

We construct an ε -thin polygonal 2-dimensional fiber $\Sigma_\varepsilon^{(\xi),n}$, $n \in \mathbb{N}$, $0 < \varepsilon < 1$, around pre-fractal approximating domains $\Omega^{(\xi),n}$ and related suitable energy functionals

The aim of this paper is to study the asymptotic behavior of the reinforced energy functionals while, simultaneously, the thickness of the fibers and the conductivity of the functionals on the fibers converges to 0 as $n \rightarrow +\infty$.

Keywords: Elliptic operators, weights, homogenization, fractals, asymptotics.
