THIN DOMAINS WITH EXTREMELY HIGH OSCILLATORY BOUNDARIES

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Abstract

In this talk we analyze the behavior of solutions of the Neumann problem posed in a thin domain of the type $R^\epsilon = \{(x_1, x_2) \in R^2 \mid x_1 \in (0,1),\, -\epsilon\, b(x_1) < x_2 < \epsilon\, G(x_1, x_1/\epsilon^\alpha)\}$ with $\alpha > 1$ and $\epsilon > 0$, defined by smooth functions $b(x)$ and $G(x,y)$, where the function G is supposed to be $l(x)$-periodic in the second variable y. The condition $\alpha > 1$ implies that the upper boundary of this thin domain presents a very high oscillatory behavior. Indeed, we have that the order of its oscillations is larger than the order of the amplitude and height of R^ϵ given by the small parameter ϵ. We also consider more general and complicated geometries for thin domains which are not given as the graph of certain smooth functions, but rather more comb-like domains.

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