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Homogenization of an anisotropic perturbation problem in a domain with an imperfect interface

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This work aims to provide a study on the limiting behavior of some class of anisotropic elliptic problem posed in a bounded domain with two components in $\mathbb{R}^N$ for $N \geq 2$ as $\varepsilon \rightarrow 0$, representing the thermal diffusion in a composite material made up of two constituents. We suppose that there is a discontinuity on the common interface depicted by a jump on the flux as well as on the temperature between the two materials. We first formulate a suitable adaptation of the Periodic Unfolding Method for some bounded sequences in this geometric setting. Then comes its application to find the asymptotic behavior of the problem up to the associated convergence of the energy.

Keywords: anisotropic problem, asymptotic behavior, homogenization, periodic unfolding method, two-component domain

MSC2020: 35A15, 35B27, 35B40, 35M12