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Asymptotic analysis for a class of heat diffusion problems in composites with non-standard imperfect contact conditions

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In this talk, we shall present some recent homogenization results for a class of heat diffusion problems in an ε-periodic two-phase composite material with imperfect contact conditions between its constituents. Here, ε is a small parameter related to the characteristic dimension of the underlying microstructure. On the interface separating the two phases, inspired by [1], we impose several non-standard transmission conditions of non-local type, obtained through a concentration procedure, by assuming that the interface is the limit of a thin anisotropic layer. By using periodic homogenization techniques, various macroscopic models are obtained at the limit (see [2, 3]).

Our setting might have applications in the analysis of diffusion processes in biological composite materials and, also, in the study of the electrical conduction in living tissues.

References

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