

Asymptotic Methods in Partial Differential Equations
An International Conference in honor of Professor Grigory Panasenko
University Jean Monnet, Saint-Étienne, France
From October 19 to October 20, 2023

A Way How Bloch Waves can understand Hashin-Shtrikman Microstructures

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Abstract

In this lecture we apply spectral methods by using the Bloch waves to study the homogenization process in the non-periodic class of generalized Hashin-Shtrikman micro-structures (Tartar in "The General Theory of Homogenization", volume 7 of Lecture Notes of the Unione Matematica Italiana, Springer, Berlin, p. 281, 2009), which incorporates both translation and dilation with a family of scales, including one subclass of laminates. We establish the classical homogenization result providing the spectral representation of the homogenized coefficients. It offers a new lead towards extending the Bloch spectral analysis in a non-periodic to non-commutative class of micro-structures.

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