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## Homogenization Structures and Applications II

In part I of this article [Z. Analysis Anwendungen 22 (2003) 73–107] we presented a mathematical theory of homogenization structures and we subsequently constructed a new homogenization approach that proves highly fitted to systematically tackle nonstochastic homogenization problems beyond usual periodic homogenization theory. In this way, various concrete homogenization problems arising in nonperiodic physical processes can henceforth be considered. Of course, this releases us from the classical periodicity hypothesis to which reference is usually systematically made for lack of a suitable mathematical framework beyond the periodic setting. With a view to pointing out the wide scope of this new homogenization approach, we consider in this paper two classes of homogenization problems of major interest as regards their close connection with practical applications: the so-called discrete problems dealing with differential operators whose coefficients are constant on each cell  $\varepsilon(k + Y)$  with  $k \in \mathbb{Z}^N$ , where  $\varepsilon > 0$  and  $Y = (0, 1)^N$ , and the so-called composite homogenization problems arising in the technology of composite materials. The exactness of the homogenization results confirms the essential role the homogenization structures are destined to play in homogenization.

**Keywords:** Homogenization structures, discrete homogenization, composite homogenization.

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