Krajowa Konferencja Zastosowań Matematyki w Biologii i Medycynie

Sandomierz, 5th–9th September 2016

EFFECTIVE PROPERTIES OF FIBER BIOMATERIALS

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ABSTRACT

Many of the structures found in nature, has the form of elastically interacting each other fibers. We consider the two continuous linear elastic two-dimensional bodies connected by the structural interface. The fibres are consider as random composites with equal unidirectional fibers of circular section with isotropic components. For definiteness, the discussed composites are assumed to be macroscopically isotropic. According to Muskhelishviliès approach, two-dimensional elastic problems for media with non-overlapping inclusions we are reduce to boundary value problems for analytic functions in multiply connected domains and next to system of functional-differential equations. This system can be solved by the method of successive approximation under some natural conditions. For random composites we will find analytical formulas for effective bulk and shear moduli in the any order approximation in the concentration f.

ACKNOWLEDGEMENTS

Author has been partially supported by the Centre for Innovation and Transfer of Natural Science and Engineering Knowledge of University of Rzeszów.

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