Homogenization of Fibers Reinforced Composite Materials for Simulation Analysis

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The article is aimed to the development of homogenization procedures for fibers reinforced composite materials. The development of these procedures during the homogenization was performed by using a representative volume element (RVE). Two RVE versions were developed, hexagonal and square fiber arrangement. Both modules are automated and have been developed in the Python programming language with connection to FEM software Abaqus, which serves as a solver, and post processor. Afterwards the assembled modules follow homogenization of particular composite structures, which results are in a comparison with result gained from other homogenization methods (analytical methods for homogenization of composite materials) are processed into tables.

Keywords: homogenization, representative volume element (RVE), composite materials, finite element method

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