Effective thermal and mechanical properties of randomly oriented short and long fiber composites

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Highlights

- The microstructure studied in this paper is a composite made up of randomly oriented long fibers (RLFC)
- A computational homogenization is performed to investigate its DRVE (Deterministic Representative Volume Element)
- It appeared that the RLFC does not respect the convergence of the apparent properties calculated under different boundary conditions
- This indicates that it does not adhere to the definition of the DRVE
- The present work consists primarily in investigating the causes of this problem by verifying its isotropy and studying composites with random fiber shapes and randomly oriented short fibers
- With the identification of these factors, the calculability of the DRVE of a random composite can be predicted simply by verifying the morphology of the microstructure