Influence of the fiber clustering on the apparent and effective elastic properties of short fiber reinforced composites

F. Fritzen, C. Engelhardt, and T. Böhlke

Institute of Engineering Mechanics, Chair for Continuum Mechanics
Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Abstract. The apparent and effective elastic properties of short fiber reinforced composites are investigated. The focus is on the determination of the influence of fiber clustering on the response of the heterogeneous material. Similar approaches have been pursued by [1] for circular or spherical particles.

Periodic artificial microstructures are generated and the a high quality discretization based on Netgen [2] is created for the use with the finite element model. A Monte Carlo type study based on the finite element method is carried out to provide estimates of the influence of microstructural changes onto the elastic parameters.

References

[1] Mishnaevsky, L.: *Computational mesomechanics of composites: numerical analysis of the effect of microstructures of composites on their strength and damage resistance*, Wiley, 2007.

[2] Schöberl, J.: *NETGEN An advancing front 2D/3D-mesh generator based on abstract rules*, Computing and Visualization in Science **1:1**, p. 41-52, 1997.