



Technische
Universität
Braunschweig



GRK 2075

Vortrag im Gästeprogramm des GRK 2075 -
Modelle für die Beschreibung der Zustandsänderung bei Alterung von Baustoffen

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Numerical investigation of unit cells for vibration isolation using classical and auxetic microstructures

Mittwoch, 12.09.2018, 14.45 Uhr
Institut für Wissenschaftliches Rechnen
Mühlenpfordtstrasse 23, 8. OG, Raum 812

In the present investigation, a band-gap region, i.e. the isolation of certain frequencies, through the optimization of the shape and microstructure of the unit cells is considered. In general, a lattice is considered as an assembly of classical structural elements, such as beams, plates, etc. Each cell of the lattice is discretized using the finite element method, and more specifically with plane stress elements. The homogenized behavior of the system is extracted from the detailed investigation of the representative volume cell. In the present investigation, a lattice with a microstructure is considered. The shape of the unit cells can be triangular, quadratic, hexagonal, etc, depending on the studied pattern. The shape and the microstructure of the lattice can be optimized in order to achieve isolation of the desired frequencies. This can be done using either the trial-and-error method or global optimization methods, such as genetic algorithms. Auxetic materials can be useful in this direction.

Kontakt

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