On the realization of the bulk modulus bounds for two-phase viscoelastic composites - DTU Orbit (05/12/2018)

On the realization of the bulk modulus bounds for two-phase viscoelastic composites

Materials with good vibration damping properties and high stiffness are of great industrial interest. In this paper the bounds for viscoelastic composites are investigated and material microstructures that realize the upper bound are obtained by topology optimization. These viscoelastic composites can be realized by additive manufacturing technologies followed by an infiltration process. Viscoelastic composites consisting of a relatively stiff elastic phase, e.g. steel, and a relatively lossy viscoelastic phase, e.g. silicone rubber, have non-connected stiff regions when optimized for maximum damping. In order to ensure manufacturability of such composites the connectivity of the matrix is ensured by imposing a conductivity constraint and the influence on the bounds is discussed. © 2013 Elsevier Ltd. All rights reserved.