

Sławomir Czarnecki, Tomasz Łukasiak; *Bending-Free Lattices as Underlying Optimal Isotropic Microstructures of the Least-Compliant 2D Elastic Bodies,*

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Abstract

This study puts forward a method of reconstruction of the suboptimal isotropic truss microstructures for the known distribution of Young's modulus and Poisson's ratio predicted by the Isotropic Material Design (IMD) method of minimizing the compliance (maximizing the stiffness) of a 2D elastic body. The varying underlying microstructures corresponding to the optimal designs are recovered by matching the values of the optimal elastic moduli with the values of the effective moduli of the representative volume elements (RVE) computed by the asymptotic homogenization method. ...