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Nonlinear Overall Viscoelastic Properties of the Random Multicomponent Media

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Theoretical determination of the overall properties of inhomogeneous media is a problem of a great importance. This work is concerned with the prediction of the effective or overall response of a random multi-component media with nonlinear visco-elastic constituents. The elastic properties of inhomogeneous structures have been studied intensively during last decades. But there are a lot of questions arising in the case when visco-elastic response is a subject of investigation, nonlinear especially. The continuum considered here is suggested to be subjected to finite deformation. Kirchhoff stress tensor and deformation gradients are used as field variables in a fixed reference state. Nonlinear problem is investigated in second order approximation theory when the gradient deformation terms higher than second order are neglected. Five constant elastic potential in elastic problem and five time functionals in visco-elastic one are used to build overall constitutive relations.

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