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Mechanical response of fiber-reinforced incompressible non-linearly elastic solids. (English)

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Summary: The mechanical response of some fiber-reinforced incompressible non-linearly elastic solids is examined under homogeneous deformation. In particular, the materials under consideration are neo-Hookean models augmented with a function that accounts for the existence of a unidirectional reinforcement. This function endows the material with its anisotropic character and is referred to as a reinforcing model. The nature of the anisotropy considered has a particular influence on the shear response of the material, in contrast to previous analyses in which the reinforcing model was taken to depend only on the stretch in the fiber direction.

MSC:

74B20 Nonlinear elasticity

Cited in **63** Documents

Keywords:

transverse isotropy; reinforcing models; anisotropy; fiber reinforcement

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