

A mathematical model for nonlinear viscoelastic materials

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Obtaining an accurate yet tractable mathematical approach to the modelling of nonlinear viscoelastic materials remains a challenge. There is increasing urgency in achieving this objective as many engineering and biological materials exhibit large strains and viscoelastic behaviour under modest loads. This talk will offer a reappraisal of Fung's model for quasilinear viscoelasticity (QLV). A number of negative features exhibited in other published works, commonly attributed to the Fung approach, are merely a consequence of the way it has been applied to-date. The present approach yields improved behaviour, and offers a straightforward scheme for solving a wide range of models. For the case of imposed uniaxial loading, a straightforward numerical solution to a Volterra integral equation is required to obtain the resultant strain. Finally, application of the approach to homogenous and inhomogenous materials will be discussed.

Références

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2. De Pascalis, R., Abrahams, I. D., Parnell, W. J, *Simple shear of a compressible quasilinear viscoelastic material*, International Journal of Engineering Science, Vol. 88, Pages 64-72, DOI information : 10.1016/j.ijengsci.2014.11.011, 2015