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Viscoelastic spectrum analysis and the identification of a fung viscoelastic material

Babaei, Behzad; Davarian, Ali; Pryse, Kenneth; Elson, Elliot; Thomopoulos, Steven; Genin, Guy, Washington University in St. Louis, United States; Abramowitch, Steven, University of Pittsburgh, United States

ABSTRACT

Despite its many limitations, the Fung “quasi-linear viscoelastic” constitutive model continues to serve as a work-horse of the biomechanics community. A central challenge in applying the model is that it requires a specific form for the relaxation spectrum that is difficult to relate to easily obtained experimental spectra such as a generalized Maxwell relaxation spectrum. Here, we present a simple and general technique for obtaining a from relaxation data a viscoelastic spectrum appropriate to the Fung model. We apply the model to identify several biomaterials that are modeled reasonably by a Fung model, and many more that are not.