A mathematical model for nonlinear viscoelastic materials

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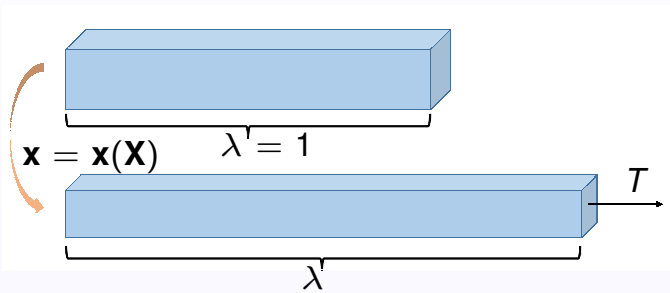
A reappraisal of Fung's model for QLV

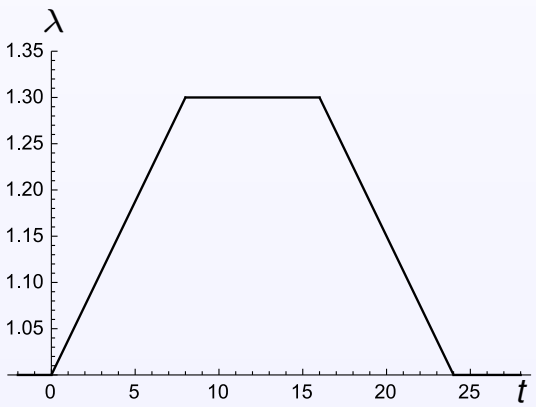
$$\Pi_{ij}(t) = \int_{-\infty}^{t} G_{ijkl}(t-\tau)\frac{\partial \Pi^{e}_{kl}(\tau)}{\partial \tau}\,\mathrm{d}\tau$$

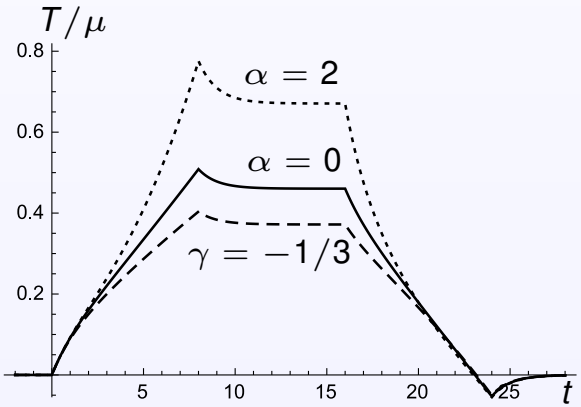
- Π is the 2nd Piola-Kirchhoff stress
- G_{ijkl} is a **reduced relaxation function tensor** independent of the strain

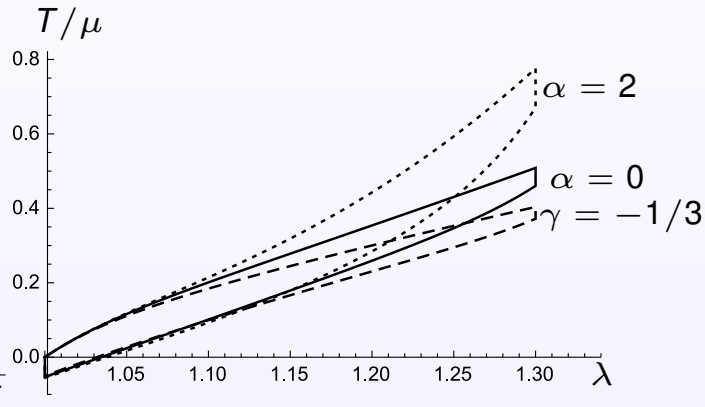
FUNG'S MODEL IS PERHAPS THE MOST WIDELY USED TODAY ESPECIALLY TO DESCRIBE THE BEHAVIOUR OF BIOLOGICAL SOFT TISSUE, BUT HAS MET SOME CRITICISM

HERE WE REAPPRAISED THIS LAW OVERCOMING THE SHORTCOMINGS OF PREVIOUS VERSIONS OF FUNG'S APPROACH









PREDICTIONS FOR A YEOH MATERIAL AND FOR A MOONEY-RIVLIN MATERIAL