

1145-35-649

Manuel Friedrich, Einsteinstr. 62, Muenster, Germany, and **Martin Kruzik***, Pod vodarenskou vezi 4, 1 Prague, Czech Rep. *On the passage from nonlinear to linearized viscoelasticity.*

We formulate a quasistatic nonlinear model for nonsimple viscoelastic materials at a finite-strain setting in the Kelvin-Voigt rheology where the viscosity stress tensor complies with the principle of time-continuous frame indifference. We identify weak solutions in the nonlinear framework as limits of time-incremental problems for vanishing time increment. Moreover, we show that linearization around the identity leads to the standard system for linearized viscoelasticity and that solutions of the nonlinear system converge in a suitable sense to solutions of the linear one. The same property holds for time-discrete approximations, and we provide a corresponding commutativity result. Our main tools are the theory of gradient flows in metric spaces and Γ -convergence. (Received September 12, 2018)