$$\dot{\tau} = 2G\dot{\gamma} - \eta\tau$$

$$\dot{\tau} + \eta\tau = 2G\dot{\gamma}$$

$$e^{\eta t}\dot{\tau} + \eta e^{\eta t}\tau = 2G\dot{\gamma}\, e^{\eta t}$$

$$\frac{d}{dt}\left[\tau\, e^{\eta t}\right] = 2G\dot{\gamma}\, e^{\eta t}$$

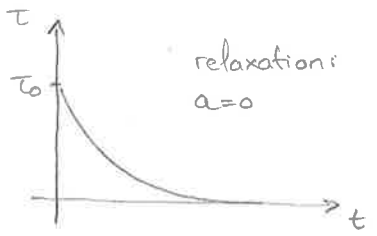
assume $\gamma = \gamma_e t + b \rightarrow \dot{\gamma} = a$

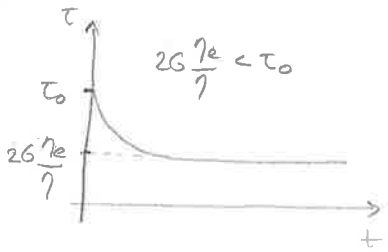
$$\tau e^{\eta t} = 2G\frac{\gamma_e}{\eta} e^{\eta t} + \tau_c$$

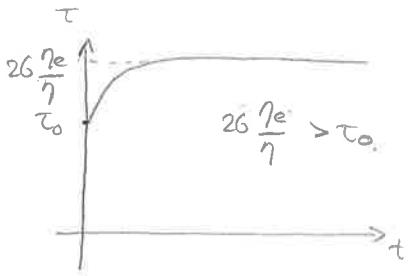
$$\tau = 2G\frac{\gamma_e}{\eta} + \tau_c e^{-\eta t}$$

apply $\tau(t=0) = \tau_0 \rightarrow \tau_c = \tau_0 - 2G\frac{\gamma_e}{\eta}$

$$\tau = 2G\frac{\gamma_e}{\eta} + \left(\tau_0 - 2G\frac{\gamma_e}{\eta}\right) e^{-\eta t}$$







Implementation

$\tau_0 = \sigma_y / \sqrt{3}$ (because σ_y is compared to $\sigma_{eq} = \sqrt{\frac{3}{2}\, \sigma_d : \sigma_d}$)

$\eta = 1 / T_{damp}$

$\gamma_e = 1 / T_{load}$.

see example.py