 06/23/21

1) $$\tilde{\sigma} = 2\tilde{\varepsilon}_{zz}\left[C_{13}(S_{ij})\left(g(S_{ij})\frac{I_1[\sqrt{f}]/\sqrt{f}}{\hat{E}(S_{ij})I_0[\sqrt{f}]-2I_1[\sqrt{f}]/\sqrt{f}}-\frac{1}{2}\right)+\frac{C_{33}(S_{ij})}{2}+f_1(S_{ij})f_2(c,\tau_1,\tau_2)\frac{I_0[\sqrt{f}]-2I_1[\sqrt{f}]/\sqrt{f}}{2(\hat{E}(S_{ij})I_0[f]-I_1[f]/\sqrt{f}}\right]$$

2) $$\tilde{\varepsilon}_{zz} = \mathring{\varepsilon}_0 t_g \frac{1-e^{-\frac{t_0}{t_g}s}}{s^2}$$

3) $$\begin{bmatrix} S_{rr} & S_{r\theta} & S_{rz} \\ S_{r\theta} & S_{rr} & S_{rz} \\ S_{rz} & S_{rz} & S_{zz} \end{bmatrix} \quad S_{rr} = \frac{1}{E_{rr}},\ S_{r\theta} = -\frac{\nu_{r\theta}}{E_{rr}}, \quad S_{rz} = -\frac{\nu_{rz}}{E_{rr}},\ S_{zz} = \frac{1}{E_{zz}}$$

4) $$C_{13}(S_{ij}) = \frac{S_{rz}}{\alpha(S_{ij})},\ C_{33} = -\frac{(S_{rr}+S_{r\theta})}{\alpha(S_{ij})},\ \alpha(S_{ij}) = 2S_{rz}^2 - S_{zz}S_{r\theta} - S_{rr}S_{zz}.$$

5) $$g(S_{ij}) = -\frac{(2S_{rz}+S_{zz})(S_{rr}-S_{r\theta})}{\alpha(S_{ij})}$$

6) $$f_1(S_{ij}) = \frac{\hat{E}(2S_{rz}+S_{zz})}{2\alpha(S_{ij})},\ \hat{E} = -2\frac{(S_{rr}S_{zz}-S_{rz}^2)}{\alpha(S_{ij})}$$

7) $$f = \frac{r_0^2 s}{\hat{E}Kf_2(c,\tau_1,\tau_2)},\ t_g = \frac{r_0^2}{\hat{E}K}$$

Invert $\tilde{\sigma}$ in terms of t/t_g. Use the following parameters:

E_r	E_{zz}	$\nu_{r\theta}$	ν_{rz}	t_g	τ_1	τ_2	C	t_0/t_g	$\dot{\varepsilon}_0$
8.5 kPa	19 kPa	0.75	0.24	40 s	0.1 s	10 s	1	0.1	0.01 s^{-1}