Coupled Equations:

$$C_{\mathrm{el}}\frac{\partial}{\partial t}T_{\mathrm{el}}(t,z)=\frac{\partial}{\partial z}\kappa\frac{\partial}{\partial z}T_{\mathrm{el}}(t,z)-g[T_{\mathrm{el}}(t,z)-T_{\mathrm{ph}}(t,z)]\ +S(t,z)$$

$$C_{\mathrm{ph}}\frac{\partial}{\partial t}T_{\mathrm{ph}}(t,z)=g[T_{\mathrm{el}}(t,z)-T_{\mathrm{ph}}(t,z)]$$

initial condition:

$$T_{el}(z,t=0)=350K$$
$$T_{ph}(z,t=0)=350K$$

Boundary condition:

$$\frac{\partial T_{el}}{\partial z}\Big|_{z=0}=\frac{\partial T_{ph}}{\partial z}\Big|_{z=0}=0$$
$$\frac{\partial T_{el}}{\partial z}\Big|_{z=l}=\frac{\partial T_{ph}}{\partial z}\Big|_{z=l}=0$$

Coefficients:

$$C_{\mathrm{el}}=\gamma_0+\gamma_1 T_{\mathrm{el}}$$

$$k=k_0\frac{T_{el}}{T_{ph}}$$

$$k_0=72\ Wm^{-1}K^{-1}$$

$$C_{\mathrm{ph}}=C_2+\frac{C_1-C_2}{1+(T_{\mathrm{ph}}/T_0)^p}+mT_{\mathrm{ph}},$$

$$g = 8.95\times10^{17}\quad \mathrm{W\ K^{-1}\ m^{-3}}$$
$$\gamma_0 = 7.8849\times10^4$$
$$\gamma_1 = 249.14$$

$$C_1=-3.57785\times10^5\ \mathrm{J\ K^{-1}\ m^{-3}}$$

$$C_2=2.801128\times10^6\ \mathrm{J\ K^{-1}\ m^{-3}}$$

$$T_0=62.98191\ \mathrm{K},\quad p=2.06271$$

$$\mathrm{m}=278.44328\ \mathrm{J\ K^{-2}\ m^{-3}}$$

Source:

$$S(z,t)=\frac{1}{2B\lambda_z}\exp\left(-\frac{z}{\lambda_z}\right)\left[F_1\mathrm{sech}^2\left(\frac{t-t_1}{B}\right)+F_2\mathrm{sech}^2\left(\frac{t-t_2}{B}\right)\right]$$