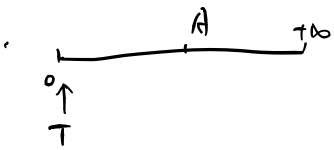

$$\lim_{A\to\infty} U(A,t)=0$$

$$T(A=0,t)=b\sin(wt)$$

$$U(A,t)=\bar{U}(A)e^{iwt}$$

$$T(A,t)=\bar{T}(A)e^{iwt} \longrightarrow T(0,t)=be^{iwt}.$$

$$\begin{cases} R_0\dfrac{\partial^2 U}{\partial t^2}=\dfrac{\partial T}{\partial A} \\ T+z_0\dfrac{\partial T}{\partial t} = E\left(\dfrac{\partial U}{\partial A}+z_1\dfrac{\partial^2 U}{\partial A\partial t}\right)\end{cases}$$

$$\Rightarrow \begin{cases} -R_0\,\bar{U}(A)\,w^2=\dfrac{\partial \bar{T}}{\partial A}. \\ \bar{T}(A)=E\,\dfrac{1+iwz_1}{1+iwz_0}\cdot\dfrac{d\bar{U}}{dA}\end{cases}$$

$$\begin{cases} \Rightarrow -R_0(\bar{U}(A))w^2=\dfrac{\partial \bar{T}}{\partial A}=E\,\dfrac{1+iwz_1}{1+iwz_0}\cdot\dfrac{d^2\bar{U}}{dA^2} \\ \Rightarrow \dfrac{d^2\bar{U}(A)}{dA^2}=-\chi^2\,\bar{U}\end{cases}$$

$$\begin{cases} \Rightarrow -R_0w^2\,\dfrac{d\bar{U}(A)}{dt}=\dfrac{\partial^2 T}{\partial A^2}=\bar{T}(A)\,\dfrac{1}{E}\,\dfrac{1+iwz_0}{1+iwz_1}(-R_0w^2) \\ \Rightarrow \dfrac{d^2T}{\partial A^2}=-\chi^2\,\bar{T}(A) \qquad \bar{T}(A)=\alpha\exp(i\chi A)+\beta\exp(i\chi A)\end{cases}$$

$$\begin{cases} \bar{T}(A)\big|_{A=0}=b \\ \lim\limits_{A\to\infty}\bar{T}(A)=0\end{cases} \Rightarrow \quad \bar{T}(A)=b\,\frac{e^{i\chi A}-e^{-i\chi A+2i\chi l}}{1-e^{2i\chi l}}\Bigg|_{l\to\infty}$$

$$=be^{-i\chi A}.$$

So. $\bar{U}(A)\Big|_{A=0} = \frac{-i\chi}{-R_0\omega^2} b\, e^{-i\chi A} = \frac{ib\chi}{R_0\omega^2} e^{-i\chi A}\Big|_{A=0}$

$$= \frac{ib\chi}{R_0\omega^2}$$

$$U(A=0,t) = \frac{ib\chi e^{i\omega t}}{R_0\omega^2}$$

$$= \frac{ib e^{i\omega t}}{R_0\omega^2} \cdot \sqrt{\frac{R_0\omega^2}{E}\,\frac{1+i\omega z_0}{1+i\omega z_1}}$$

$$= \frac{ibe^{i\omega t}}{\omega}\sqrt{\frac{1}{RE}\,\frac{1+\omega^2 z_0 z_1 + i\omega(z_0-z_1)}{1+\omega^2 z_1^2}}$$

$$= ibe^{i\omega t}\,\frac{1}{\omega\sqrt{RE}}\cdot\left(\frac{1+\omega^2 z_0^2}{1+\omega^2 z_1^2}\right)^{\frac{1}{4}} e^{i\delta}.$$

$$\tan 2\delta = \frac{\omega(z_0-z_1)}{1+\omega^2 z_0 z_1}$$

So. $\begin{cases} U(A=0,t) = b\,\frac{1}{\omega\sqrt{RE}}\left(\frac{(1+\omega^2 z_0^2)}{(1+\omega^2 z_1^2)}\right)^{\frac{1}{4}} \sin(\omega t+\delta-\frac{\pi}{2}) \\ T(A=0,t) = b\sin(\omega t) \end{cases}$

case imposed displacement: $\tan 2\tilde{\delta} = \frac{\omega(z_1-z_0)}{1+\omega^2 z_0 z_1}$

eg: $\tilde{\delta} = -\delta.$