$$\frac{1}{v}\frac{P}{K_\infty \Sigma_f}\left[A_n \frac{dT_n(t)}{dt}\right]\cos(B_n x) = \qquad B_n = \frac{n\pi}{a}x$$

$$D\left[-B_n^2\right]\frac{P}{K_\infty \Sigma_f}\left[A_n T_n(t) - S_n\right]\cos(B_n x)$$

$$-\Sigma_a \frac{P}{K_\infty \Sigma_f}\left[A_n T(t) - S_n\right]\cos(B_n x)$$

$$+P A_n e^{-B_n^2 \tau} T_n(t)\cos(B_n x)$$

Dato che $\Sigma_a = \Sigma(1-F_0)$ supponiamo $\Sigma_a \simeq \Sigma_f$ ($\sigma_a \ll \sigma_f$). Consideriamo $x=0$

$$\frac{1}{v}\frac{P A_n}{K_\infty \Sigma_a}\frac{dT_n(t)}{dt} = \frac{-P}{K_\infty}\left[\frac{DB_n^2}{\Sigma_a}+1\right]\left[A_n T_n(t) - S_n\right] + P A_n e^{-B_n^2\tau} T_n(t)$$

$$\frac{dT_n(t)}{dt} = \frac{v K_\infty \Sigma_a}{\cancel{P}\cancel{A_n}}\left\{\cancel{P}\cancel{A_n} e^{-B_n^2\tau} - \frac{\cancel{P}\cancel{A_n}}{K_\infty}\left[\frac{DB_n^2}{\Sigma_a}+1\right]\right\}T_n(t)$$

$$+\frac{v \cancel{K_\infty}\Sigma_a}{\cancel{P}A_n}\left\{\frac{\cancel{P}}{\cancel{K_\infty}}\left[\frac{DB_n^2}{\Sigma_a}+1\right]S_n\right\}$$

$$= v\Sigma_a\left\{K_\infty e^{-B_n^2\tau} - \left[\frac{DB_n^2}{\Sigma_a}+1\right]\right\}T_n(t)$$

$$+\frac{v\Sigma_a}{A_n}\left[\frac{DB_n^2}{\Sigma_a}+1\right]S_n$$

$$= v\Sigma_a\left[\frac{DB_n^2}{\Sigma_a}+1\right]\left\{\left[\frac{K_\infty e^{-B_n^2\tau}}{\frac{DB_n^2}{\Sigma_a}+1} - 1\right]T_n(t) + \frac{S_n}{A_n}\right\}$$

Definiamo

$$\frac{1}{l_n} = v\Sigma_a\left[\frac{DB_n^2}{\Sigma_a}+1\right] \qquad K_n = \frac{K_\infty e^{-B_n^2\tau}}{\frac{D}{\Sigma_a}B_n^2+1}$$