$$T = Ae^{\frac{-\delta T}{1+\frac{I}{I_{sat}}}}$$

$$T(I) = \frac{e^{-\alpha_0 L}}{\beta I(1 - \frac{e^{-\alpha_0 L}}{\alpha_0}) + 1}$$

$$\frac{(1-T)EQ_s}{\hbar\omega} = \int L(t)dt$$

$$I_{sat}, \delta T$$

$$|E_s^0|^2 = \frac{\hbar^2}{4|\mu_{ba}|^2 T_1 T_2}$$

$$I_s^0 = 2\epsilon_0 c|E_s^0|^2$$

$$I_s^0 = \frac{2\epsilon_0 c\hbar^2}{4|\mu_{ba}|^2 T_1 T_2}$$

$$I_s \approx \frac{h\nu}{\sigma_0 \tau}$$

$$\alpha = \frac{\alpha_0}{1 + \frac{I}{I_s}}$$

$$\sigma = \beta I$$