$$\varepsilon_1 = \delta(t') + \chi^{d}(t')$$

$$\vec{E}(\vec{r},t) = \vec{E}_0\, R(g)\, A(z,t)\exp\{i(kz-\omega t)\}$$

$$\Delta\vec{E} - \frac{1}{c^2}\frac{\partial^2}{\partial t^2}\int_0^\infty \varepsilon_1(t')E(\vec{r},t-t')\,dt' = \frac{\varepsilon_2}{c^2}\frac{\partial^2}{\partial t^2}|E|^2\vec{E}$$

$$A(z,t-t') = A - t'\dot{A} + \frac{1}{2}t'^2\ddot{A}$$

$$A'' + i2kA' + i2kk'\dot{A} - (k'^2 + kk'')\ddot{A} = -\frac{\varepsilon_2}{c^2}\omega^2\alpha\,|A|^2A$$

$$\frac{1}{|A_0|}\frac{\partial A}{\partial t} = \frac{1}{t_0}\frac{\partial B}{\partial \tau}$$

$$\frac{1}{|A_0|}\frac{\partial A}{\partial z} = \frac{1}{z_0}\frac{\partial B}{\partial \xi} - \frac{1}{v t_0}\frac{\partial B}{\partial \tau}$$

$$\frac{1}{|A_0|}\left(\frac{\partial A}{\partial z} + \frac{1}{v}\frac{\partial A}{\partial t}\right) = \frac{1}{z_0}\frac{\partial B}{\partial \xi}$$

$$\frac{\partial B}{\partial \tau} = q_0 B\,\frac{e^x - e^{-x}}{(e^x + e^{-x})} \Rightarrow \frac{\partial B}{\partial \tau^2} = -\frac{e\,Bq_0^2}{(e^x+e^{-x})^2}$$

$$\frac{\partial B}{\partial \xi} = \frac{\hat{e}}{2}q_0^2 B \qquad ; |B|^2B = q_0^2\left(\frac{2}{e^x+e^{-x}}\right)^2 B$$