3.2 Dispersion

$$e\vec{E}(\vec{r}) = e\vec{E}_0 \exp\{-i(\vec{q}\cdot\vec{r} - \omega t)\}$$

$$= e\vec{E}_0 \exp\{-i(\vec{q}\cdot(\vec{r}-\vec{R}) - \omega t)\} \exp\{-i\vec{q}\cdot\vec{R}\}$$

$$(-\omega^2 + i\omega\gamma + \omega_0^2)(\vec{r}-\vec{R}) = A\frac{e}{m}\vec{E}(\vec{r},t)$$