

## 3.2 Dispersion

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

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