

$$\rho_e \vec{J}_e \quad \rho_m \vec{J}_m$$

$$\nabla^2 \vec{A} + \omega^2 \mu \epsilon \vec{A} = -\mu \vec{J}_e$$

$$\vec{A} = \frac{\mu}{4\pi} \iiint \vec{J}_e \frac{e^{-jk|\vec{r}-\vec{r}'|}}{|\vec{r}-\vec{r}'|} dv'$$

$$\nabla^2 \vec{F} + \omega^2 \mu \epsilon \vec{F} = -\mu \vec{J}_m$$

$$\vec{F} = \frac{\epsilon}{4\pi} \iiint \vec{J}_m \frac{e^{-jk|\vec{r}-\vec{r}'|}}{|\vec{r}-\vec{r}'|} dv'$$

$$\vec{B}_A = \nabla \times \vec{A}$$

$$\vec{E}_A = \frac{1}{j\omega\mu\epsilon} \left[\nabla (\nabla \cdot \vec{A}) + \omega^2 \mu \epsilon \vec{A} \right]$$

$$-\vec{D}_F = \nabla \times \vec{F}$$

$$\vec{H}_F = \frac{1}{j\omega\mu\epsilon} \left[\nabla (\nabla \cdot \vec{F}) + \omega^2 \mu \epsilon \vec{F} \right]$$

$$\vec{E}_{\text{total}} = \vec{E}_A + \vec{E}_F$$

$$\vec{H}_{\text{total}} = \vec{H}_A + \vec{H}_F$$