256(5): The Electromagnetic Field Equations of ECE Theory in Vector Notation.

Homogeneous

$$\underline{\nabla} \cdot \underline{B}^a = \underline{\omega}^a{}_b \cdot \underline{B}^b - \underline{A}^b \cdot \underline{R}^a{}_b(\text{spin}) = 0$$

$$\frac{\partial \underline{B}^a}{\partial t} + \underline{\nabla} \times \underline{E}^a = \underline{\omega}^a{}_b \times \underline{E}^a - c\omega_0 \underline{B}^a - \left(\underline{A}^b \times \underline{R}^a{}_b(\text{orb}) - A^b_0 \underline{R}^a{}_b(\text{spin})\right) = 0$$

Inhomogeneous

$$\underline{\nabla} \cdot \underline{E}^a = \frac{\rho^a}{\epsilon_0} = \underline{\omega}^a{}_b \cdot \underline{E}^b - c\underline{A}^b \cdot \underline{R}^a{}_b(\text{orb}) \neq 0$$

$$\underline{\nabla} \times \underline{B}^a - \frac{1}{c^2}\frac{\partial \underline{E}^a}{\partial t} = \mu_0 \underline{J}^a$$

$$= \underline{\omega}^a{}_b \times \underline{B}^b + \frac{\omega_0}{c}\underline{E}^b - \left(\underline{A}^b \times \underline{R}^a{}_b(\text{spin}) + A^b_0 \underline{R}^a{}_b(\text{orb})\right)$$

$$\neq 0$$

2) Simplified Theory

Homogeneous

$$\underline{\nabla} \cdot \underline{B} = \underline{\omega} \cdot \underline{B} - \underline{A} \cdot \underline{R} \,(\text{spin}) = 0$$

$$\frac{\partial \underline{B}}{\partial t} + \underline{\nabla} \times \underline{E} = \underline{\omega} \times \underline{E} - c\omega_0 \underline{B} - \left(\underline{A} \times \underline{R}(\text{orb}) - A^b_0 \underline{R}(\text{spin}) \right)$$

$$= 0$$

In Homogeneous

$$\underline{\nabla} \cdot \underline{E} = \rho / \epsilon_0 = \underline{\omega} \cdot \underline{E} - c\underline{A} \cdot \underline{R}\,(\text{orb}) \neq 0.$$

$$\underline{\nabla} \times \underline{B} - \frac{1}{c^2} \frac{\partial \underline{E}}{\partial t} = \mu_0 \underline{J}$$

$$= \underline{\omega} \times \underline{B} + \frac{\omega_0}{c} \underline{E} - \left(\underline{A} \times \underline{R}(\text{spin}) + A^b_0 \underline{R}(\text{orb}) \right)$$

$$\neq 0$$