116(5): The Field Potential Equations of ECE Theory.

Electrodynamics

$$\underline{E} = -\underline{\nabla}\phi - \frac{\partial \underline{A}}{\partial t} + \phi\underline{\omega} - \omega^{\circ}\underline{A} \quad -(1)$$

$$\underline{B} = \underline{\nabla}\times\underline{A} - \underline{\omega}\times\underline{A}. \quad -(2)$$

Dynamics

$$\underline{g}_{o} = -\underline{\nabla}\Phi - c\frac{\partial \underline{q}}{\partial t} + \Phi\underline{\omega} - c\omega^{\circ}\underline{q} \quad -(3)$$

$$\underline{h}_{o} = c^{2}\left(\underline{\nabla}\times\underline{q} - \underline{\omega}\times\underline{q}\right) \quad -(4)$$

Field Equations

Electrodynamics

$$\underline{\nabla}\cdot\underline{B} = j^{\circ} \sim 0 \quad -(5)$$

$$\underline{\nabla}\times\underline{E} + \frac{\partial \underline{B}}{\partial t} = \underline{j} \sim 0 \quad -(6)$$

$$\underline{\nabla}\cdot\underline{D} = \rho \quad -(7)$$

$$\underline{\nabla}\times\underline{H} - \frac{\partial \underline{D}}{\partial t} = \underline{J} \quad -(8)$$

Dynamics

$$\underline{\nabla}\cdot\underline{g} = 4\pi G\rho_{m} \quad -(9)$$

$$\underline{\nabla}\times\underline{h} - \frac{1}{c}\frac{\partial \underline{g}}{\partial t} = 4\pi G\underline{J}_{m} \quad -(10)$$

$$\underline{\nabla}\cdot\underline{h}_{o} = 0 \quad -(11)$$

$$\underline{\nabla}\times\underline{g}_{o} + \frac{1}{c}\frac{\partial \underline{h}_{o}}{\partial t} = \underline{0} \quad -(12)$$

Notes

Here $\underline{g}_0$ plays the role of $\underline{E}$, $\underline{h}_0$ plays the role of $\underline{B}$, $\underline{g}$ plays the role of $\underline{D}$ and $\underline{h}$ plays the role of $\underline{H}$. Eqs. (5), (6), (11) and (12) are free field equations. Eqs. (7), (8), (9) and (10) are field matter equations. Also, eqs. (7), (8), (9) and (10) have Hodge dual field matter equations.