

If we only take the lowest order effects of the motion of mass sources into account and neglect stresses, we can define two vector field, \vec{E} and \vec{B} , which are similar to the electric and magnetic field. We can define $A_\mu = -\frac{1}{4}c_0\bar{h}_{0\mu} = (\varphi/c_0, \vec{A})$, then A_μ , which are similar to the electromagnetic 4-potential, will satisfy

$$\partial^\nu \partial_\nu A_\mu = -\frac{4\pi G_0}{c_0^2} J_\mu, \quad \partial^\mu A_\mu = 0, \quad (1)$$

where $J_\mu = -c_0 T_{0\mu}/c_0^2 = (c_0\rho, \vec{j}) = \rho(c_0, \vec{v})$ is 4-momentum density. If we define $\vec{E} = -\vec{\nabla}\varphi - \frac{\partial}{\partial t}\vec{A}$, $\vec{B} = \vec{\nabla} \times \vec{A}$, and $\varepsilon_{G0} = \frac{1}{4\pi G_0}$, $\mu_{G0} = \frac{4\pi G_0}{c_0^2}$, then there will be

$$\begin{cases} \vec{\nabla} \cdot (\varepsilon_{G0}\vec{E}) = \rho, \\ \vec{\nabla} \cdot \vec{B} = 0, \\ \vec{\nabla} \times \vec{E} = -\frac{\partial}{\partial t}\vec{B}, \\ \vec{\nabla} \times (\mu_{G0}^{-1}\vec{B}) = \vec{j} + \frac{\partial}{\partial t}(\varepsilon_{G0}\vec{E}), \end{cases} \quad (2)$$

and the acceleration of mass particle \vec{a} will satisfy

$$\vec{a} = -\vec{E} - 4\vec{v} \times \vec{B}. \quad (3)$$

Since (??) are identical to Maxwell's equations, and (??) is identical to the Lorentz force equation except for an overall minus sign and a factor of 4 in the "magnetic force" term, we assume that the constants ε_{G0} and μ_{G0} can simply vary as constants ε_0 and μ_0 in electromagnetic theories, which means, (??) is still valid and (??) becomes

$$\begin{cases} \vec{\nabla} \cdot \vec{D} = \rho, \\ \vec{\nabla} \cdot \vec{B} = 0, \\ \vec{\nabla} \times \vec{E} = -\frac{\partial}{\partial t}\vec{B}, \\ \vec{\nabla} \times \vec{H} = \vec{j} + \frac{\partial}{\partial t}\vec{D}, \end{cases} \quad (4)$$

where $\vec{D} = \varepsilon_G \vec{E}$, $\vec{B} = \mu_G \vec{H}$. Also, we define $c = \frac{1}{\sqrt{\varepsilon_G \mu_G}}$, $G = \frac{1}{4\pi \varepsilon_G}$, together with $\vec{E} = -\vec{\nabla}\varphi - \frac{\partial}{\partial t}\vec{A}$, $\vec{B} = \vec{\nabla} \times \vec{A}$, and $\bar{h}_{0\mu} = -4A_\mu/c = -4(\varphi/c, \vec{A})/c$.