Large Charge Electrodynamics And Special Relativity

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ABSTRACT

Both electrodynamic calculations from Maxwell and relativistic calculations from Einstein concur for electrodynamics of point charges and radiation problems of steadily moving (henceforth 'moving') bodies.

The electric field, the magnetic field, electromagnetic momentum, longitudinal electromagnetic mass, transverse electromagnetic mass, energy of a moving point charge are the same in both the calculations. This, too, is true for the electromagnetic force acting on a moving point charge, radiation problems of dipoles and accelerating point charges moving with the system, transverse Doppler's effect and increment of life spans of moving radioactive particles. Similarly, fringe-shifts of the Fizeau experiment, laws of addition of velocities of moving charges inside a moving conductor, the magnetic field originating from an infinitely long straight wire carrying a steady current and moving in the direction of flow of the current, as calculated from those two radically different approaches are exactly the same.

But, the results of these two different ways of calculations markedly differ for large charge electrodynamics i.e., for the cases when moving charged body or the moving charge itself occupies an appreciable volume or surface-area in space.

As for examples, the electric field, the magnetic field, electromagnetic momentum, energy, longitudinal and transverse electromagnetic mass of a moving charged spheroid, charged ellipsoid or charged large body are different as per calculations from those two different approaches. This, too, is true for the electromagnetic force acting on a charged large body while moving, the magnetic fields originating from surface currents and volume currents flowing within the moving system in any arbitrary directions, angle of radiation from a moving radiating dipole. The most interesting difference arises in the calculations of the effects of electromagnetic systems stationary on earth while the observer measuring the effect moves on it.

Therefore, the mission of special relativity can partly be successful if the results of the experiments of the second category stated in the previous paragraph conform only to the calculations from special relativity. Unfortunately, relativists are innocently unaware of this crucial situation.

1. Introduction : Foundation of Special relativity rests on electrodynamics. Electrodynamics, too, deals with the problems that special relativity encounters.

In the paper, we have given the results of calculation of electrodynamic phenomena from the considerations of Maxwell as well as from the considerations of Einstein and compared these results with the available experimental results to verify the superiority of special relativity over the electrodynamics of Maxwell.

2. Electrodynamics from Maxwell's Field Equations : It happens to be certain that there are charges and movement of charges inside matter and currents are movements of charges. Therefore, there are electric field (E) and magnetic field (B) inside matter. The E-field and B-field inside matter stationary in free space are governed by Poisson's equations. We may call the system of charges and currents inside matter stationary in free space as the stationary system S_0 .

When a piece of matter translates in free space in the OX direction with a constant velocity of translation u, the electric field and the induced magnetic field B* as well known are governed by D' Alembert's equations viz.,

$$\frac{\partial^2\Phi}{\partial x^2}+\frac{\partial^2\Phi}{\partial y^2}+\frac{\partial^2\Phi}{\partial z^2}-\frac{1}{c^2}\frac{\partial^2\Phi}{\partial t^2}=-\frac{\rho}{e_0} \quad (1)$$

and $$\frac{\partial^2\mathbf{A}^*}{\partial x^2}+\frac{\partial^2\mathbf{A}^*}{\partial y^2}+\frac{\partial^2\mathbf{A}^*}{\partial z^2}-\frac{1}{c^2}\frac{\partial^2\mathbf{A}^*}{\partial t^2}=-\frac{\rho\mathbf{u}}{e_0c^2} \quad (2)$$

where Φ and ρ are the scalar potential and density of the system of charges and A* and ρu are the vector potential and current density of the system of currents inside matter stationary in free space, e_o and μ_o are permittivity and permeability of free space,

$c = 1/\sqrt{\mu_0 e_0}$ and the introduced Cartesian co-ordinate is in the free space.

Comparing (1) and (2) we have

$$A_x{}^* = \frac{u}{c^2}\Phi, A_y{}^* = 0, A_z{}^* = 0, \quad (3)$$

(u_y and u_z being 0)
(A^*_y and A^*_z being 0)

We may call such a system, the dynamic system S where charges (and currents) inside matter move with the matter in free space with a constant velocity of translation u in the OX direction. Now, in such a situation, the potentials at the point (x,y,z) at the instant t and the potentials at the point (x+udt, y,z) at the instant t + dt will be the same. Therefore,

$$\Phi+\frac{\partial\Phi}{\partial t}dt+\frac{\partial\Phi}{\partial x}.udt=\Phi \quad (4)$$

$$\therefore \frac{\partial\Phi}{\partial t}=-u\frac{\partial\Phi}{\partial x} \quad (5)$$

$$\frac{\partial^2\Phi}{\partial t^2}=+u^2\frac{\partial^2\Phi}{\partial x^2} \quad (6)$$

Similarly, $$\frac{\partial A_x^*}{\partial t}=-u^2\frac{\partial\Phi}{\partial x}/c^2 \quad (7)$$

[using equations (3) and (5)]

Now, the equation (1) could be written as

$$\left(1-\frac{u^2}{c^2}\right)\frac{\partial^2\Phi}{\partial x^2}+\frac{\partial^2\Phi}{\partial y^2}+\frac{\partial^2\Phi}{\partial z^2}=-\frac{\rho}{e_0} \quad (8)$$

Now if we substitute

$$x' = \frac{x}{\sqrt{1-\frac{u^2}{c^2}}}, y' = y, z' = z \quad (9)$$

(or $x' = \gamma$ (x-ut), $y' = y$, $z' = z$ (10)

when $\gamma = 1/k$ and $k = \sqrt{1-\frac{u^2}{c^2}}$ (11)

if electromagnetic action is considered after the time t of the instant, when the co-ordinate attached with the system coincide with the co-ordinate attached with the free space), the volume charge density in this transformation becomes

$$\rho/ = \rho k \tag{12}$$

and the equation (8) takes the form

$$\frac{\partial\ \Phi}{\partial x^{/2}}+\frac{\partial^2\Phi}{\partial y^{/2}}+\frac{\partial^2\Phi}{\partial z^{/2}}=-\frac{\rho}{e_0} \tag{13}$$

which is again a Poisson's equation.
The equation (10) conjointly with the equation (11) may be called the auxiliary transformation equation of Heaviside and Thomson.

Now, the value of Φ of the S system will be shown below to be connected with the potential $\Phi^/$ of a stationary auxiliary system $S^/$ in which all the co-ordinates parallel to OX have been changed in the ratio determined by the equation (11).

This transformed co-ordinate $S^/$ ($x^/$, $y^/$, $z^/$) system which is obviously imaginary will be used as a mathematical tool to correlate electromagnetic phenomena between static S_o and dynamic state S [1,2,3].

This transformed auxiliary elongated co-ordinate system will be called as Auxiliary system $S^/$, the role of which in electro-dynamics was first exemplified by Thomson. He, thus, has developed the way of solving dynamic potential problems in a static way through an unreal static auxiliary equation in the form of Poisson's equation which correlates between the static and dynamic states.
Now in the Auxiliary system $S^/$, we have,

$$\frac{\partial\ \Phi^/}{\partial x^{/2}}+\frac{\partial^2\Phi^/}{\partial y^{/2}}+\frac{\partial^2\Phi^/}{\partial z^{/2}}=-\frac{\rho^/}{e_0}=-\frac{\rho\sqrt{1-\frac{u^2}{c^2}}}{e_0} \tag{14}$$

where $\Phi^/$ = electrostatic potential in Auxiliary system.
By comparison (13) and (14) we have, $\Phi^/ = \Phi k$

$$\text{Or } \Phi = \gamma\Phi^/ \tag{15}$$

Therefore, [using the equation (7) & (15)]

$$E_x=-\frac{\partial\Phi}{\partial x}-\frac{\partial A_x^*}{\partial t}=-\frac{\partial\Phi}{\partial x}+\frac{u^2}{c^2}\frac{\partial\Phi}{\partial x}=-\frac{\partial\Phi^/}{\partial x^/}=E_x^/$$

$$\mathbf{E}_y=\frac{-\partial\Phi}{\partial y}-\frac{\partial A_y{}^*}{\partial t}=-\frac{\partial\Phi}{\partial y}(Ay^*\text{being}\quad 0)=-\frac{\gamma\partial\Phi^/}{\partial y^/}=\gamma E_y^/, \tag{16}$$

Similarly, $E_z = \gamma E_z^/$
From B* = ∇ x A*, we have

$B^*_x = 0$,

$$B^*_y = -\frac{u}{c^2}E_z=-\gamma\frac{u}{c^2}E_z^/ \tag{17}$$

$$B_z^*=\frac{u}{c^2}E_y=\gamma\frac{u}{c^2}E_y^/$$

The equations (16 & 17) are general, and these may be used to determine the electric fields and the induced magnetic fields of moving charges of any shape and size.

For the independent magnetic field inside matter moving with a constant velocity of translation u, we have,

$$\frac{\partial^2 A_x}{\partial x^2}+\frac{\partial^2 A_x}{\partial y^2}+\frac{\partial^2 A_x}{\partial z^2}-\frac{1}{c^2}\frac{\partial^2 A_x}{\partial t^2}=-\frac{\rho V_x}{e_0c^2} \tag{18}$$

and $$\frac{\partial^2 A_y}{\partial x^2}+\frac{\partial^2 A_y}{\partial y^2}+\frac{\partial^2 A_y}{\partial z^2}-\frac{1}{c^2}\frac{\partial^2 A_y}{\partial t^2}=-\frac{\rho V_y}{e_0 c^2} \qquad (19)$$

and the similar equation for the Z-component and which could be transformed (in a way previously shown) to the following equations viz.,

$$\frac{\partial^2 A_x}{\partial x'^2}+\frac{\partial^2 A_x}{\partial y'^2}+\frac{\partial^2 A_x}{\partial z'^2}=-\frac{\rho V_x}{e_0 c^2} \qquad (20)$$

$$\frac{\partial^2 A_y}{\partial x'^2}+\frac{\partial^2 A_y}{\partial y'^2}+\frac{\partial^2 A_y}{\partial z'^2}=-\frac{\rho V_y}{e_0 c^2} \qquad (21)$$

and the similar equation for the Z' component where ρV is the current density in S system.

In the auxiliary system S', for line currents flowing within the moving system in any arbitrary directions and for surface currents and volume currents flowing within the moving system in the direction of movement of the system, (i.e., when magnetic field depends on the length of the current element but not on its cross section) we have,

$$\frac{\partial^2 A'_x}{\partial x'^2}+\frac{\partial^2 A'_x}{\partial y'^2}+\frac{\partial^2 A'_x}{\partial z'^2}=-\frac{\rho' V_x}{e_0 c^2}=-\frac{\rho\sqrt{1-\frac{u^2}{c^2}}.V_x}{e_0 c^2} \qquad (22)$$

$$\frac{\partial^2 A'_y}{\partial x'^2}+\frac{\partial^2 A'_y}{\partial y'^2}+\frac{\partial^2 A'_z}{\partial z'^2}=-\frac{\rho V_y}{e_0 c^2} \qquad (23)$$

and the similar equation for the Z'-component. By comparison of (20) and (22), (21) and (23), we have,

$$A_x=\gamma A'_x,\ A_y=A'_y,\ A_z=A'_z \qquad (24)$$

whence,

$$B_x=\left[\frac{\partial A_z}{\partial y}-\frac{\partial A_y}{\partial z}\right]=\left[\frac{\partial A'_z}{\partial y'}-\frac{\partial A'_y}{\partial z'}\right]=B'_x$$

$$By=\left[\frac{\partial Ax}{\partial z}-\frac{\partial A\,z}{\partial x}\right]=\left[\frac{\gamma\partial A'_x}{\partial z'}-\gamma\frac{\partial A'_z}{\partial x'}\right]=\gamma B'_y \qquad (25)$$

$$B_z=\left[\frac{\partial A_y}{\partial x}-\frac{\partial A\,x}{\partial y}\right]=\left[\gamma\frac{\partial A'_y}{\partial x'}-\gamma\frac{\partial A'_x}{\partial y'}\right]=\gamma B'_z$$

where A_x', A_y' and A_z' are the components of the Auxiliary magnetic potential in the Heavisidean auxiliary elongated system S'. For the induced vector, we have the relation E* = -u x B, from which we have,

$$E_x^*=0,\ E_y^*=uB_z=\gamma uB'_z,\ E^*_z=-uB_y=-\gamma uB'_y \qquad (26)$$

Now, if the source of an independent electric field (originating from charges of any shape and size) and an independent magnetic field (originating from line currents flowing within the system in any arbitrary directions and from surface currents and volume currents flowing within the system in the direction of movement of the system) inside the system move with a constant velocity of translation u in free space with the system then from the consideration of equations (16), (17), (25), and (26), we have the following Heaviside – Thomson auxiliary field equations :

$$Ex = Ex^{/} \qquad Bx = Bx^{/}$$

$$E_y = \gamma\left[E^{/}_y + uB^{/}_z\right] \qquad B_y = \gamma\left[B^{/}_y - \frac{u}{c^2}E^{/}_z\right]$$

$$E_z = \gamma\left[E^{/}_z - uB^{/}_y\right] \qquad B_z = \gamma\left[B^{/}_z + \frac{u}{c^2}E^{/}_y\right] \qquad (27a)$$

Or

$$E^{/}_x = Ex \qquad B^{/}_x = Bx$$

$$E^{/}_y = \gamma\left[E_y - uB_z\right] \qquad B^{/}_y = \gamma\left[By + \frac{u}{c^2}E_z\right]$$

$$E^{/}_z = \gamma\left[E_z + uB_y\right] \qquad B^{/}_z = \gamma\left[By - \frac{u}{c^2}E_y\right] \qquad (27b)$$

(solely derived from Heaviside-Thomson, Faraday and Ampere-Maxwell), where E and B are the electric and the magnetic fields of the system of charges and currents having a constant velocity of translation u in free space, $E^{/}$ and $B^{/}$ are auxiliary quantities which relate E and B to static electric and magnetic fields (E_0, B_0) of the system of charges and currents stationary in free space.

Those equations are also valid for induced electromagnetic fields when the inductor or the inducted body moves with respect to the free space.

3. Point charge electrodynamics :

Maxwell's consideration :-

(i) The electric field (E) and the induced magnetic field (**B***) of a point charge (q) moving steadily with a constant velocity of translation u in free space at a point (x, y, z) or (r, θ, ϕ) at the instant when the charge crosses the origin [4,5] are as follows :-

$$E = \frac{qk^2}{4\pi e_0 r^2 \,(1 - \frac{u^2}{c^2}\,\mathrm{Sin}^2\theta)}\bar{r}\,, \qquad (28)$$

$$B* = \frac{u \text{ x } E}{c^2} \qquad (29)$$

(ii) The electromagnetic momentum of the above moving point charge [4,5,6,7]

$$G = \gamma\frac{q^2 u}{6\pi e_0 c^2 \delta R} \qquad (30)$$

(iii) Electric energy $U = \gamma\dfrac{\left(3 - \frac{u^2}{c^2}\right)q^2}{24\pi e_0 \delta R}$ (31)

(iv) Magnetic energy $T = \gamma\dfrac{u^2}{c^2}\dfrac{q^2}{12\pi e_0 \delta R}$ (32)

(v) $U + T = \gamma\dfrac{\left(1 + \frac{1}{3}\frac{u^2}{c^2}\right)q^2}{8\pi e_0 \delta R}$ (33)

(vi) Total energy [4,5] $\varepsilon = \gamma\dfrac{q^2}{6\pi e_0 \delta R}$ (34)

(vii) Longitudinal electromagnetic mass [4,5].

$$m' = \gamma^3 \frac{q^2}{6\pi e_0 c^2 \delta R} \qquad (35)$$

(viii) transverse electromagnetic mass $m'' = \gamma \dfrac{q^2}{6\pi e_0 c^2 \delta R}$ (36)

δR represents the major axis of that ellipsoid which resembles a point charge in respect of its electromagnetic quantities. δR can be determined from the equation (35) or (36) when a moving point charge (say an electron) is subjected to an electromagnetic field.

(ix) Transverse Doppler effect [4,5]

$$\omega_{trans.} = \omega_0 k \qquad (37)$$

where $\omega_{trans.}$ and ω_0 are the radian frequencies of the radiating dipole in dynamic and stationery status.

(x) Increment of life spans of moving radioactive particles [4,5]

$$t = \gamma t_0 \qquad (38)$$

where t and t_0 are the life times of the radioactive particles at the dynamic and stationary particles respectively.

(xi) The velocity of light beam in a moving medium [4,5]

$$Vx = \frac{c}{n} + u\left(1 - \frac{1}{n^2}\right) \qquad (39)$$

where u is the velocity of the medium and n is the refractive index.

(xii) Velocity of charges in a moving conductor [4,5]

$$V_x = \frac{u + v_x}{1 + \frac{uv_x}{c_2}} \qquad (40)$$

$$V_y = \frac{v_y k}{1 + \frac{uv_x}{c_2}} \qquad (41)$$

$$V_z = \frac{v_z k}{1 + \frac{uv_x}{c_2}} \qquad (42)$$

where v is the velocity of the charges in the stationery conductor, and u is the velocity of the conductor.

(xiii) Magnetic field (**B**) originating from an infinitely long straight wire carrying a steady current (I) and moving with a velocity u in the direction flow of the current, **B** being measured at a distance z above the wire

$$B = \frac{\mu_0 I}{2\pi z} \qquad (43)$$

All the laws given above are exactly the same as calculated from the consideration of Einstein. Therefore, any verification of those laws in the domain of point charge electrodynamics and point charge radiations from moving system could hardly establish the superiority of one over another.

Relativists, quite unaware of the situation, often cite experimental results in these domains in their favor.

4. **Large Charge Electrodynamics**

From the consideration of Maxwell, Max Abraham of Göttingen [8] calculated for the first time the electromagnetic momentum of a moving charge uniformly distributed over the surface of a sphere using the equations of the auxiliary system stated in the section 2 of this paper. Searle, too, in an ingenious treatment has deduced the electromagnetic energy of a charged spheroidal and ellipsoidal conductor in the same way [9].

The electromagnetic momentum G of a moving charge (q) uniformly distributed over the surface of a sphere, has been shown as [8] :

$$G = \frac{q^2}{16\pi e_0 Rc}\left(\frac{1+\beta^2}{\beta^2}\log\frac{1+\beta}{1-\beta} - \frac{2}{\beta}\right) \tag{44}$$

The electric energy of the same moving charge,

$$U = \frac{q^2}{32\pi e_0 R}\left(\frac{3-\beta^2}{\beta}\log\frac{1+\beta}{1-\beta} - 2\right) \tag{45}$$

The magnetic energy

$$T = \frac{q^2}{32\pi e_0 R}\left(\frac{1+\beta^2}{\beta}\log\frac{1+\beta}{1-\beta} - 2\right) \tag{46}$$

Electromagnetic energy

$$U + T = \frac{q^2}{8\pi e_0 R}\left(\frac{1}{\beta}\log\frac{1+\beta}{1-\beta} - 1\right) \tag{47}$$

longitudinal electromagnetic mass

$$m' = \frac{q^2}{8\pi e_0 R\beta^3 c^2}\left(\frac{2\beta}{1-\beta^2} - \log\frac{1+\beta}{1-\beta}\right) \tag{48}$$

and transverse electromagnetic mass

$$m'' = \frac{q^2}{8\pi e_0 R\beta^3 c^2}\left(-2\beta + \left(1+\beta^2\right)\log\frac{1+\beta}{1-\beta}\right) \tag{49}$$

where $\beta = \frac{u}{c}$ and R is the radius of the sphere.

All those results markedly differ from Einstein’s results which are

$$G = \gamma\frac{q^2 u}{6\pi e_0 c^2 R} \tag{50}$$

$$U = \gamma\frac{\left(3 - \frac{u^2}{c^2}\right)q^2}{24\pi e_0 R} \tag{51}$$

$$T = \gamma\frac{u^2}{c^2}\frac{q^2}{12\pi e_0 R} \tag{52}$$

$$U + T = \gamma\frac{\left(1 + \frac{1}{3}\frac{u^2}{c^2}\right)q^2}{8\pi e_0 R} \tag{53}$$

Stress energy of the moving sphere which is seen as a contracted ellipsoid from the moving system [10].

$$S = \frac{q^2 k}{24\pi e_0 R} \tag{54}$$

Total energy $\mathcal{E}$ = U + T + S $= \gamma\frac{q^2}{6\pi e_0 R}$ (55)

Longitudinal electromagnetic mass

$$m' = \gamma^3 \frac{q^2}{6\pi e_0 c^2 \delta R} \tag{56}$$

transverse electromagnetic mass $m'' = \gamma \frac{q^2}{6\pi e_0 c^2 \delta R}$ (57)

There is no experimental evidence in the domain of large charge electrodynamics in favor of either Maxwell or Einstein.

5. Angle of Radiation of a Moving Radiating Dipole :

From the consideration of Maxwell, the angle of radiation (θ) of a radiating dipole moving with a velocity of translation (u) in free space is related with the angle of radiation (θ_0) of the same radiating dipole stationary in free space [11] as follows :-

$$\tan\theta = \frac{Sin\theta_0 k^2}{Cos\theta_0 + \frac{u}{c}\sqrt{1 - \frac{u^2}{c^2} Sin^2\theta}} \tag{58}$$

whereas the same angle could be calculated from Einstein as

$$\tan\theta = \frac{Sin\theta_0 k}{Cos\theta_0 + \frac{u}{c}} \tag{59}$$

None of those two equations has been tried in experiment.

6. Surface Current and Volume Current Electrodynamics :

When surface current and volume current flow within the moving system in any arbitrary direction, we have, the following equations for the auxiliary system S′

$$\nabla'^2 A'_x = -\mu_0 \rho \sqrt{1 - u^2/c^2} \quad V_x \tag{60}$$

$$\nabla'^2 A'_y = -\mu_0 \rho \sqrt{1 - u^2/c^2} \quad V_y \tag{61}$$

$$\nabla'^2 A'_z = -\mu_0 \rho \sqrt{1 - u^2/c^2} \quad V_z \tag{62}$$

Comparing the equations (60), (61) and (62) with the equations (20), (21) and the similar equation for the Z component, we have

$$A_x = \gamma A'_x, \qquad A_y = \gamma A'_y \text{ and } A_z = \gamma A'_z. \tag{63}$$

Whence,

$$B_x = \left[\frac{\partial A_z}{\partial y} - \frac{\partial A_y}{\partial z}\right] = \gamma\left[\frac{\partial A'_z}{\partial y'} - \frac{\partial A'_y}{\partial z'}\right] = \gamma B'_x$$

$$B_y = \left[\frac{\partial A_x}{\partial z} - \frac{\partial A_z}{\partial x}\right] = \gamma\left[\frac{\partial A'_x}{\partial z'} - \gamma\frac{\partial A'_z}{\partial x'}\right] \tag{64}$$

$$B_z = \left[\frac{\partial A_y}{\partial x} - \frac{\partial A_x}{\partial y}\right] = \gamma\left[\gamma\frac{\partial A'_y}{\partial x'} - \frac{\partial A'_x}{\partial y'}\right]$$

Now, if the source of an independent electric field and independent magnetic field originating from surface current and volume current inside matter moves with a constant velocity of translation in the free space with the matter, we have the following Thomson-Heaviside equations.

$$E_x = E'_x$$
$$E_y = \gamma\left[E'_y + u\left(\gamma\frac{\partial A'_y}{\partial x'} - \frac{\partial A'_x}{\partial y'}\right)\right] \qquad (65)$$
$$E_z = \gamma\left[E'_z - u\left(\frac{\partial A'_x}{\partial z'} - \gamma\frac{\partial A'_z}{\partial x'}\right)\right]$$

$$B_x = \gamma B'_x$$
$$B_y = \gamma\left[\left(\frac{\partial A'_x}{\partial z'} - \gamma\frac{\partial A'_z}{\partial x'}\right) - \frac{u}{c^2}E'_z\right] \qquad (66)$$
$$B_z = \gamma\left[\left(\gamma\frac{\partial A'_y}{\partial x'} - \frac{\partial A'_x}{\partial y'}\right) - \frac{u}{c^2}E'_y\right]$$

But from the consideration of Einstein, the equations remain the same as (27a), which are markedly different from Maxwell.
No experiment has ever been performed to settle which of the two is correct.

7. **Nature of Space :**
From the consideration of Maxwell, when the electromagnetic system is at rest in free space while the observer measuring the effect moves with a constant velocity of translation u in free space, the equations (28-57) and (59-66) should not work. The electric field will remain the electric field so long as the charge creating the electric field remains at rest in free space. If the observer moves steadily in free space, the electric field shall neither change its magnitude, nor its direction nor a new magnetic field will emerge. A steadily moving observer who watches a radiating dipole stationary in free space should not observe transverse Doppler's effect. Similarly, there will be no increment of life spans of radio active particles, if the radioactive particles are at rest in free space and the observer moves steadily in it and so on.
But from the consideration of Einstein, the equation (28-57) and (59-66) are also valid for moving observer measuring the effects, while the electromagnetic system is at rest in free space. Therefore, a steadily moving observer should observe a new magnetic field, transverse Doppler's effect, increment of life spans of radioactive particles in the above situations Experimental evidences in favor of Einstein in such situations have not been found till this date.

8. **Conclusion :** Both electrodynamic calculations from Maxwell and relativistic calculations from Einstein are exactly the same for electrodynamics of point charges and radiation problems of steadily moving bodies. But the results of these two different ways of calculations markedly differ for the cases when moving charged body or the moving charge itself occupies on appreciable volume or surface area.
The most remarkable difference arises in the calculation of the effects of electromagnetic systems stationary on earth while the observer measuring the effect moves on it.
All meticulous experiments to establish relativity in the domain of electrodynamics are related somehow with point charge electrodynamics and radiation problems of moving bodies in cases when electromagnetic systems move steadily and the stationary observer measures the effects. Relativists cite the results of these experiments in their favor. But the same results could be predicted from Maxwell, too, in those cases.

In absence of the experiments on large charge electrodynamics and on the effects of electromagnetic system stationary on earth to a steadily moving observer measuring the effects, special relativity could not claim its superiority over Maxwell's electrodynamics.

Unfortunately, relativists are innocently unaware of this crucial situation.

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