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Maxwell's Equation for Sources and Curls of Light and Darkness, Heat and Coldness

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Abstract

.Over the ages since mankind has existed on earth, many have wondered about the relationship of light and darkness. In a scientific view point, many wonder what light components are in a photon. Here, we use electric charges or electrical currents in a photon and relate them to the heating effect of electrical power to produce heat an light, while magnetic power is related to darkness and coldness through magnetic charges or magnetic currents.

Maxwell's equations for sources and curls of light and heat, darkness and coldness are derived. It is seen that light and heat are perpendicularly oriented to darkness and coldness since electric currents are perpendicularly oriented to magnetic currents.

1 INTRODUCTION

It was pointed out that magnetic charges (monopoles) could conceivably exist despite not having been seen so far[1]. Particle physics theories like the grand unified theory and superstring theory predict the existence of magnetic charges[2, 3]. The quantum theory of magnetic charge[4] showed that if any magnetic charges exist in the universe, then all electric charge in the universe must be quantized[5]. The electric charge is, in fact, quantized, which suggests that magnetic charges exist[5]. Experiments have produced candidate events that were initially interpreted as magnetic charges[6, 7], but are now regarded as inconclusive[8]. It has been shown that all electric charge in the photon is actually the electronic electric charge in wave form, which implies that the photon and the electron can be handled in a similar manner when we consider perpendicular polarization of twin photons in the EPR (Einstein-Podolski-Rosen) hidden variable phenomenon[9]. The structure of photons (or electrons) based on the particles as consisting of magnetic waves surrounding the electrical current as the nucleus in the right hand grip rule has been given[9]. Magnetic charge in photons (or electrons) has been determined, and the orientation of magnetic and electric currents given[9]. Magnetic charge as the source of magnetic field in Maxwell's equations has been shown[9]. No theory so far gives the components of light or darkness in a photon and attempts to derive the Maxwell's equations involved. Here, vectors are in bold and scalars are in italics.

We have seen that[9], in vector form, when an electrical current flows in the y-direction in

the right hand grip rule analogue in photons, electric and magnetic charges acquire a sense of direction becoming vectors, and Plank's constant h can be written as,

$$\begin{aligned}\mathbf{h_x} &= \mathbf{q_{ey}} \times \mathbf{q_{mz}} \\ &= \Delta\,\mathbf{q_{ey}} \times \Delta\,\mathbf{q_{mz}}\end{aligned} \qquad (1),$$

where, $\mathbf{q_{ey}}$ is the unpolarized electric charge in vector form and in wave form in a photon in Coulombs (C), $\mathbf{q_{mz}}$ is the unpolarized magnetic charge in vector form and in wave form in a photon in Volt-second (Vs), and $\mathbf{h_x} = \Delta\,\mathbf{q_{ey}} \times \Delta\,\mathbf{q_{mz}}$ is the uncertainty relation of electric and magnetic charges where Δ signifies polarization quantities from ground state conditions upon application of external fields. It has further been shown[9] that at an instant on the x-axis,

$$\begin{aligned}\mathbf{q_{mz}} &= \mathbf{R_{ex}} \times \mathbf{q_{ey}} \\ &= \Delta\,\mathbf{q_{mz}} = \Delta\,\mathbf{R_{ex}} \times \Delta\,\mathbf{q_{ey}}\end{aligned} \qquad (2),$$

where, $\mathbf{R_{ex}}$ is the resistance charge in vector form in Ohms (Ω). If a current flows at a frequency f round a closed circuit, then, unpolarized and polarized magnetic and electric currents, $\mathbf{i_{mz}}$ and $\mathbf{i_{ey}}$ at an instant are,

$$\begin{aligned}\mathbf{q_{mz}} f &= \mathbf{i_{mz}} = \mathbf{R_{ex}} \times \mathbf{q_{ey}} f = \mathbf{R_{ex}} \times \mathbf{i_{ey}} \\ &= \Delta\,\mathbf{q_{mz}} \Delta f = \Delta\,\mathbf{i_{mz}} = \Delta\,\mathbf{R_{ex}} \times \Delta\,\mathbf{q_{ey}} \Delta f = \Delta\,\mathbf{R_{ex}} \times \Delta\,\mathbf{i_{ey}}\end{aligned} \qquad (3).$$

Therefore, from equation (2),

$$\begin{aligned}\mathbf{h_x} &= \mathbf{q_{ey}} \times \left(\mathbf{R_{ex}} \times \mathbf{q}_{ey}\right) \\ &= \Delta\,\mathbf{q_{ey}} \times \left(\Delta\,\mathbf{R_{ex}} \times \Delta\,\mathbf{q}_{ey}\right)\end{aligned} \qquad (4).$$

In scalar form, equation (4) becomes, $h_x = \left(\Delta\, q_{ey}\right)^2 \Delta\, R_{ex}$. If the applied external conditions cause

polarization by $\Delta f_x = \Delta f_y = \Delta f_z$ from the original frequencies $f_{2Px} = \Delta f_{2Py} = \Delta f_{2Pz}$ in photon P as has been shown[9], then,

$$h_x(\Delta f_x)^2 = (\Delta q_{ey})^2(\Delta f_y)^2 \Delta R_{ex} = (\Delta i_{ey})^2 \Delta R_{ex} \qquad (5).$$

The Einsteinian energy is $\varepsilon = hf$ and polarization Einsteinian energy in the x-direction is $\Delta \varepsilon_x = h_x \Delta f_x$. Therefore, when external conditions are applied,

$$\Delta \varepsilon_x \Delta f_x = (\Delta i_{ey})^2 \Delta R_{ex} = \Delta P_x \qquad (6),$$

where, ΔP_x is change in electrical power in the x-direction. This change in power is the heating effect of an electrical current. Heat radiating objects produce light or glow to light. Thus electric charges in wave form in a photon glow to light when the applied polarizing frequency from the ground state conditions is in the optical range. It has been shown[9] that the magnetic field $\mathbf{B_z} = -\mathbf{q_{mz}} f_{2Px} / c_x \lambda_{2Px} = -\mathbf{i_{mz}} / c_x \lambda_{2Px}$, where $c_x = c = 2.998 \times 10^8 m/s$ is the speed of light in vacuum, and λ_{2Px} is the original unpolarized wavelength. Thus $\mathbf{B_z} \propto \mathbf{i_{mz}}$. Therefore, let light be related to electric charge, electric field and heat radiation, and let darkness be related to magnetic charge, magnetic field and coldness radiation. We have $\Delta q_{ey} = \Delta q_{mz} / \Delta R_{ex}$. Equations (5) and (6) become,

$$\begin{aligned} \Delta \varepsilon_x \Delta f_x &= (\Delta i_{ey})^2 \Delta R_{ex} = \Delta P_{ex} \\ &= \frac{(\Delta q_{mz})^2}{\Delta R_{ex}} (\Delta f_z)^2 = \frac{(\Delta i_{mz})^2}{\Delta R_{ex}} = \Delta P_{mz} \end{aligned} \qquad \left(J/s = Watt = V^2/\Omega \right) \qquad (7),$$

where, ΔP_{ex} is the change in the electrical power. It has been shown[9, 10] that $\mathbf{i_{mz}} = \mathbf{V_{eH}}$, where,

$\mathbf{V_{eH}}$ is the electrical Hall voltage perpendicular to applied electrical voltage $\mathbf{V_{ey}}$ in the right hand grip rule. Therefore, magnetic power is given as,

$$\Delta P_{mz} = \frac{(V_{eH})^2}{\Delta R_{ex}} \qquad (8).$$

Now, the space-time equations for both polarized photons P and Q are given as[9]

$$\Delta f_x = \frac{\Delta \lambda_{2Px}}{\lambda_{1Px}} f_{2Px} = \frac{\Delta \lambda_{2Px}}{\lambda_{2Px}} f_{1Px}$$
$$= \frac{\Delta \lambda_{2Qx}}{\lambda_{3Qx}} f_{2Qx} = \frac{\Delta \lambda_{2Qx}}{\lambda_{2Qx}} f_{3Qx} \qquad (9),$$

where, $x \equiv z$-axis since both are on a horizontal plane, $f_{1Px} = f_{1Pz} = 1.3 \times 10^6 Hz$, $f_{2Px} = f_{2Qx} = 2.998 \times 10^8 Hz$, $\Delta f_x = 2.985 \times 10^8 Hz$, $f_{3Qx} = f_{2Qx} + \Delta f_x = 5.983 \times 10^8 Hz$, $\lambda_{1Px} = \lambda_{1Pz} = 230.615m$, $\lambda_{2Px} = \lambda_{2Py} = \lambda_{2Pz} = \lambda_{2Qx} = \lambda_{2Qy} = \lambda_{2Qz} = 1m$, and $\lambda_{3Qx} = 0.501m$, $\Delta \lambda_{2Px} = \Delta \lambda_{2Pz} = 229.615m$, $\Delta \lambda_{2Qx} = \Delta \lambda_{2Qz} = 0.499m$. Let ℓ symbolize light and $\mathbf{d}$ symbolize darkness. Substituting Δf_x from one of the space-time equations for polarized photon P into equation (7), we have,

$$\Delta \varepsilon_x \frac{\Delta \lambda_{2Px}}{\lambda_{2Px}} f_{1Px} = (\Delta i_{ey})^2 \Delta R_{ex} = \ell = \mathbf{d} = \frac{(\Delta i_{mz})^2}{\Delta R_{ex}} = \Delta P_{ex} = \Delta P_{mz} \qquad (10).$$

If time is t, then in the limit $\Delta t \to 0$, $\Delta \lambda \equiv d\lambda$. Using partial differentials, since $\nabla = \hat{i}\left(\partial / \partial \lambda_{2Px}\right) + \hat{j}\left(\partial / \partial \lambda_{2Px}\right) + \hat{k}\left(\partial / \partial \lambda_{2Px}\right)$. Dividing equation (10) by $\Delta \lambda_{2Px}$ and converting to the partial differential, and using wavelengths as vectors, we have,

$$\nabla \cdot \ell = \Delta \varepsilon_x f_{1Px} \Big/ \boldsymbol{\lambda}_{\mathbf{2Px}} = P_{ex} \Big/ \boldsymbol{\lambda}_{\mathbf{2Px}} = \mathbf{P}_{\mathbf{ex}\ell} = \nabla \cdot \mathbf{d} = \Delta \varepsilon_x f_{1Pz} \Big/ \boldsymbol{\lambda}_{\mathbf{2Pz}} = P_{mz} \Big/ \boldsymbol{\lambda}_{\mathbf{2Pz}} = \mathbf{P}_{\mathbf{mz}\ell},$$ where,

$P_{ex} = \Delta \varepsilon_x f_{1Px}$, $P_{mz} = \Delta \varepsilon_z f_{1Pz}$, $\mathbf{P}_{\mathbf{ex}\ell}$ is the electrical power linear density, and $\mathbf{P}_{\mathbf{mz}\ell}$ is the magnetic power linear density. Separating terms, we write,

$$\nabla \cdot \ell = \frac{(\Delta i_{ey})^2 \Delta R_{ex}}{\Delta \lambda_{2Px}} = \frac{(\Delta q_{ey})^2 (\Delta f_x)^2 \Delta R_{ex}}{\Delta \lambda_{2Px}} = \frac{P_{ex}}{\boldsymbol{\lambda}_{\mathbf{2Px}}} = \mathbf{P}_{\mathbf{ex}\ell}$$

$$\nabla \cdot \mathbf{d} = \frac{(\Delta i_{mz})^2}{\Delta \lambda_{2Px} \Delta R_{ex}} = \frac{(\Delta q_{mz})^2 (\Delta f_z)^2}{\Delta \lambda_{2Px} \Delta R_{ex}} = \frac{P_{mz}}{\boldsymbol{\lambda}_{\mathbf{2Pz}}} = \mathbf{P}_{\mathbf{mz}\ell} \qquad (11).$$

The source of light and heat radiation is therefore the polarization electrical charge or the polarization electrical currents while the source of darkness and coldness radiation is the polarization magnetic charges or the polarization magnetic currents. However, the sources of light and heat, darkness and coldness are the same quantity. Indeed, light and heat are perpendicularly oriented to darkness and coldness since electric currents are perpendicularly oriented to magnetic currents.

Since ∇ and Δ are polarization symbols, then external means must be applied or in play in order to have light. Since darkness is always present even at non-optical frequencies, then, f_{1Pz} may be ground state or any non-optical frequency. We therefore conclude that darkness particles are always present and glow to light if the polarizing frequency is in the optical range.

It has been shown[9] during the derivation of Maxwell's equations for the curl of electric and magnetic fields that electric fields are produced by magnetic charges and magnetic fields are produced by electric charges. Therefore, electric and magnetic linear densities in equation (11) can be interchanged for curls. We write

$$\nabla \times \ell = \mathbf{P}_{\mathbf{mz}\ell}$$

$$\nabla \times \mathbf{d} = \mathbf{P}_{\mathbf{ex}\ell} \qquad (12).$$

A cast shadow is related to formation of darkness when optical frequencies are absorbed or reflected by an object placed in the path of light, proofing that darkness particles are always present. This is different from thinking that light particles are produced at the source and bombard and remove darkness particles out of their way, but darkness particles quickly replace them in Archimedes Principle style when the light source is switched off.

CONCLUSION

Relating light and heat sources to electrical charges while darkness and coldness sources are related to magnetic charges has enabled us to derive Maxwell's equations for sources and curls of light and heat, darkness and coldness.

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