A New Theory for Electromagnetic Radiation Based on Classical Electrostatics Contradicting Maxwell's Electromagnetism

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ABSTRACT

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In this paper it is shown that the energy due to electromagnetic radiation, which has thus far been ascribed the Poynting vector, based on Maxwell's Equations, may instead be derived using Coulomb's law as the basis. Since the common opinion among scientists has been that Maxwell's systematic description of electromagnetism is consistent with classical electricity described by Coulomb´s Law, a need has been felt to closer explore the differences. It has already been published a number of papers on this subject by this author, but the theoretical basis for a new approach will now be more rigorously defined.

The fallacies of the commonly recognized Maxwell electromagnetism appear in five cases, which have been explored rigorously in other papers by this author:

-Ampère's bridge: Coulomb' law explains the Ampère's bridge experiment, the Lorentz' force does not.

-Coulomb' law and the Continuity Equation of Electricity explain electromagnetic induction, whereas the 'Induction Law' does not

-The Liénard-Wiechert potentials have been fallaciously derived; hence, a cornerstone of the today's electromagnetic theory has been removed

-The attractive electromagnetic force between two parallel electric currents can be derived using Coulomb's law, provided a relativistic interpretation is being performed; hence, the Lorentz force is not needed.

-Ampère's law is not consistent with the Lorentz force; hence, there is no harmony between the 'classics' of electromagnetism.

The success in refuting the established theories, simultaneously replacing them with the new one according to the interpretation of this author, constitutes the justification for questioning also the rest of electromagnetism, and in the case of electromagnetic radiation this is being done in the following:

Describing the event during which a light quanta is released from an atom, thereafter hitting a target atom, using the most simplistic model, with a single electron orbiting around a positive nucleus, it may be suitable to model the orbiting electron as an electric current. This can be stated also about the target atom. Hence, there are two currents being involved, just as in the case of electric induction.

During stable circumstances, the electron does not radiate, since the circular movement is perpendicular to the radial electric force from the positive nucleus, an argument that is supported by Compton, but denied by Bohr.

When a de-excitation of an orbit electron occurs, it implies that the current must have a nonzero time differential. This varying current will in turn induce a current at another atom, the target. The time that this requires is very short. An appropriate mathematical model is proposed, a model that fits with the ambiguous ‘wave-particle paradox’.

The basis for the new theory is the discovery that Coulomb’s law alone is able to account for the electromagnetic force between electric currents, provided that the differences in propagation delay between the different parts of the conductors are accurately being taken into account, a phenomenon that is often denoted retardation.

The new interpretation of electromagnetic induction enables to accurately estimating the electric effect that the de-excitation of an outer shell atomic electron gives rise to at a target atom, and, accordingly the electric energy may be derived.

Embedded in this model is also a new understanding of what a photon really is, which has already been explained in earlier papers. The so-called wave-particle paradox only expresses two mathematical properties of the orbiting motion during the process of electron de-excitation.