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PHYSICS

DISTANCE MEASUREMENT BY ELECTRONS AND PROTONS IN PHENOMENON OF ELECTROMAGNETISM

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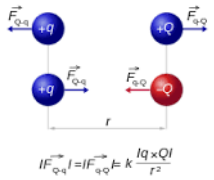
Electromagnetism is a branch of physics involving the study of the electromagnetic force, a type of physical interaction that occurs between electrically charged particles. The electromagnetic force usually exhibits electromagnetic fields such as electric fields, magnetic fields, and light and is one of the four fundamental forces in nature. The other three fundamental inter actions are the strong interaction, the weak interaction and gravitation. [1]

Coulomb's law states that the magnitude of the electrostatic force of attraction between two point charges is directly proportional to the product of the magnitudes of charges and inversely proportional to the square of the distance between them. The force is along the straight line joining them.

If the two charges have the same sign, the electrostatic force between them is repulsive; if they have different signs, the force between them is attractive.



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The force is measured by following formula-

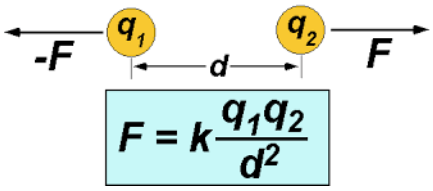
F = k * Q1 * Q2 / r² (Coulomb's inverse square law)

Where k - Constant of proportionality.
F - Force (attractive/repulsive) on each charged particle.
Q1 - Point charge 1.
Q2 - Point charge 2.
r - Distance between the two particles.
There are three conditions to be fulfilled for the validity of Coulomb's law:

1. The charges must have a spherically symmetric distribution (e.g. point charges, or a charged metal sphere).
2. The charges must not overlap (e.g. be distinct point charges).
3. The charges must be stationary with respect to each other.

Analysis:
We should try and analyse, by what means or method does any charged particle, (e.g. proton or electron) measure the distance between itself and any other charged particle? How does it always gauges the distance so precisely?

Distance perception (measurement) in space is a striking property of any elementary particle or point charge. Even human beings, the most sentient beings on planet, cannot perceive or measure distance in space accurately. (E.g., I cannot determine the exact distance between my eyes and my laptop screen without a ruler or scale.)



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Furthermore, how does an electron or proton measure its own charge amount? By what means they are able to do so? Are they self-aware?

By what method it measures the charge quantity of any charged particle placed in its vicinity? How does it differentiate between the nature of that particle, whether it is negatively charged or positively charged?

And after all this data collection by any fundamental particle, it applies the needful force?

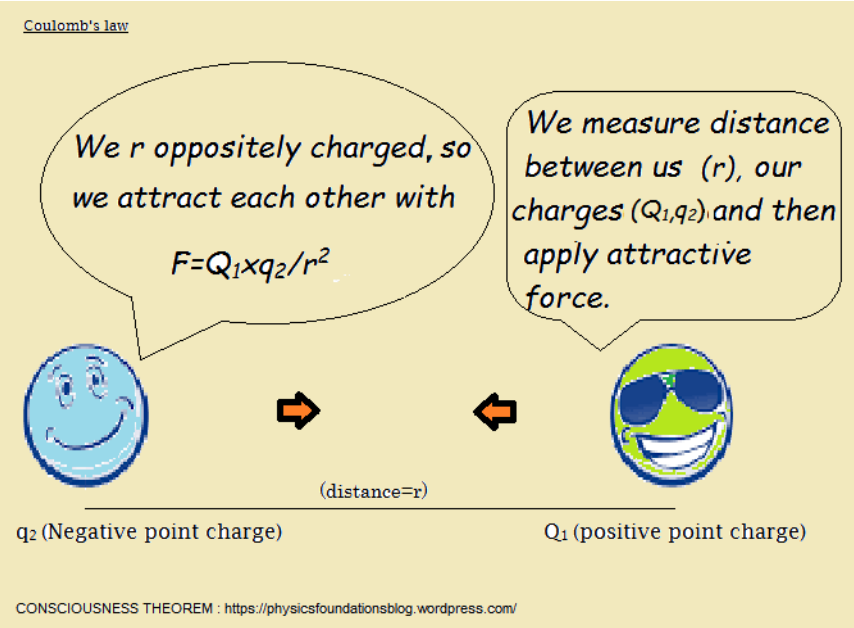
Perhaps, these are the ultimate fundamental questions to be scrutinized.

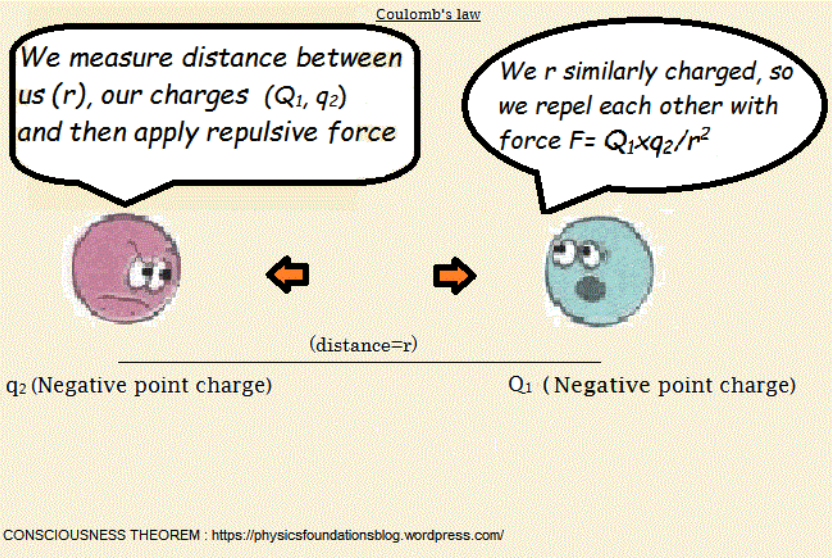
At least, we cannot deny the fact that it is doing so (or it is happening). Because, by denying it, we would probably be denying coulombs law.

Convincingly, we deduce that a proton, electron or any other point charge is able to integrate its surrounding information, as to the nature of any charged particle; its distance from that particle and amount of charge it itself carries.
We analyze that an electron and a proton can assimilate nature, charge quantity and distance of charged particles in its own context and in view of that apply attractive or repulsive force.

I stress upon the point that charged particles or entities demonstrate property of**particle perception with respect to its own description and distance measurement.**

So, should the point charge particles (electrons, protons) be considered conscious?





Deduction:

We need to develop an altered viewpoint and deeper sense of understanding to answer the above mentioned questions.

Plethora of philosophical issues will be raised and we may need to alter our foundation belief systems.

Our concern, however, should be how we are going to explain and justify the particles' undefended and expressive properties.

Sources: [1] Ravaioli, Fawwaz T. Ulaby, Eric Michielssen, Umberto (2010). Fundamentals of applied electromagnetics (6th ed.). Boston: P