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Researches Concerning Photons as Corpuscles with Mass and Negative Electrostatic Charge

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***Abstract*—**Let us consider that the entire universe is composed of a single hydrogen atom within which the electron is moving around the proton. In this case, according to classical theories of physics, radiation, photons respectively, should be absorbed by the electron. Depending on the number of photons absorbed, the electron radius of rotation around the proton is established. Until now, the principle of photons absorption by electrons and the electron transition to a new energy level, namely to a higher radius of rotation around the proton, is not clarified in physics. This paper aims to demonstrate that radiation, photons respectively, have mass and negative electrostatic charge similar to electrons but infinitely smaller. The experiments which demonstrate this theory are simple: thermal expansion, photoelectric effect and thermonuclear reaction.

***Keywords*—**Electrostatic, electron, proton, photon, radiation.

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I. Introduction

FROM the classical theory for the simplest atom, the atom of hydrogen, consisting of one proton and one electron orbiting the proton, and considering that the proton imaginative dimension is the size of a stadium while the one of the electron is the size of a bead and the distance of the electron rotation against the proton is about 10 km [2]. According with Bohr and Coulomb theories, it is known:

- Both the proton of positive charge and the electron of negative charge exercise an electrostatic field
- The electron of negative charge is captured by the proton positive charge field and is orbiting the proton according to Bohr's first postulate.
- Electrostatic force of attraction exerted by the proton is balanced by the centrifugal force of the electron

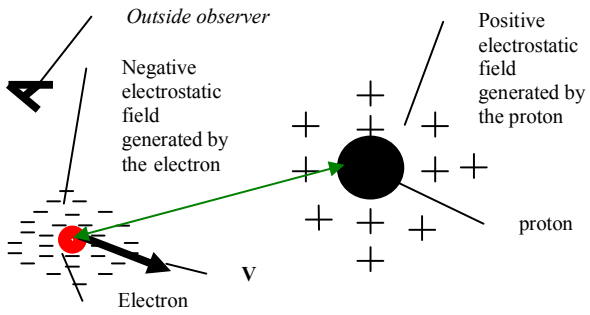


Fig. 1 Hydrogen atom

- The positive charge of the proton and the negative charge of the electron are cloud charges which decrease with the distance. The total compensation of the proton positive cloud charge by a negative charge would mean that around the proton, the negative charge would have the shape of a covering sphere.
- The hydrogen atom is in a balanced state with one proton and one electron in rotation, but the static spatial field of the proton is not completely annihilated by the static spatial field of the electron. The spatial field of the proton far exceeds the limits of the electron orbit.
- Also, the static negative field of the electron is spatial and occupies a circular arc on the orbit around the proton
- The static spatial field of the proton generates strong attraction forces for other electrons in the vicinity of the hydrogen atom
- By attracting the electrons of the atoms in the immediate vicinity the proton of the hydrogen atom attracts in fact the electron - proton assemblies, namely the neighbouring atoms, and thus chemical bonds between atoms are created and molecules are formed.
- When the static field of a proton belonging to a hydrogen atom attracts distant electrons, meaning far located electron – proton assemblies, the force generated is *the gravity force* which is much smaller than the atomic force or the force of chemical bonds [1].

II. Energy Equilibrium Equation of the Hydrogen Atom

Let us consider that the entire universe is composed of a single hydrogen atom – Fig. 1.

$$Qp = Qe \quad (1)$$

Qp - positive charge of the proton; Qe - negative charge of the electron.

According to classical theories (1), the proton charge in modulus is equal to the electron charge. The movement of the electron around the proton is actually the movement of the entire negative electrostatic field of the electron within the space of the proton positive electrostatic field. Because of the speed and mass of the electron, it stabilizes in rotation around the proton on a radius R given by the equilibrium of the electrostatic fields.

$$R = f(m_e, Ep, Ee, c) \quad (2)$$

m_e – mass of the electron; Ep – positive electrostatic field of the proton; Ee – negative electrostatic field of the electron; c – electron speed of rotation around the proton (speed of light).

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If the whole universe were composed of a single hydrogen atom, Einstein's theory of relativity [7] could be practically summarized in:

$$E=m_e c^2 \quad (3)$$

According to (3), the only element that holds energy in the structure of the atom would be the electron rotating around the proton.

III. Photon Absorption by Electrons – an Impossible Phenomenon

If the electron also includes the photon it means that the photon generates a negative electrostatic field together with the electron [3]. When the photon separates from the electron it practically detaches a part of the negative electrostatic field of the electron. Once separated and negatively charged the photon rejects the electron having the same electrostatic charge. CONCLUSION: the photon cannot return into the electron composition because they have the same negative electrostatic field in rejection [6]. Consider Fig. 2 in which the hydrogen atom gets an amount of negative charged photons from an outside source.

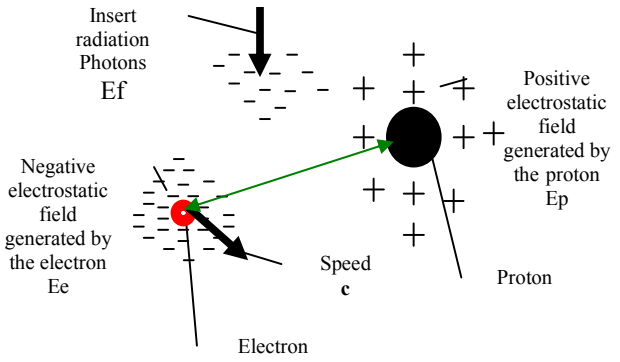


Fig. 2 Insert photons in hydrogen atom

Due to negative electrostatic charge, even if of an infinitely small value, the photons are attracted to the positive electrostatic charge of the protons [1]. Both electron and photons will rotate in the space around the proton. The energy equation of the hydrogen atom, considering the insertion of negative electrostatic charged photons becomes:

$$Qp = Qe + \sum Qf \quad (4)$$

Because of the negative charged photons insertion, the electrostatic force of attraction of the proton to the electron decreases proportionally with the amount of negative charges of ΣQf photons and photons radius of rotation around the proton. In (5), the radius of rotation of the electron is also influenced by the negative electrostatic field generated by the photons insertion.

$$R = f(m_e, Ep, Ee, Ef, c) \quad (5)$$

Theoretically, the photons will also launch in a rotational motion around the proton and due to the strong negative electrostatic charge of the electron, they will be constantly pushed forward by the electron. As compared to the electron the photons have the mass and the electrostatic charge infinitely smaller, thus the electron will practically push back some of the photons outside of the hydrogen atom.

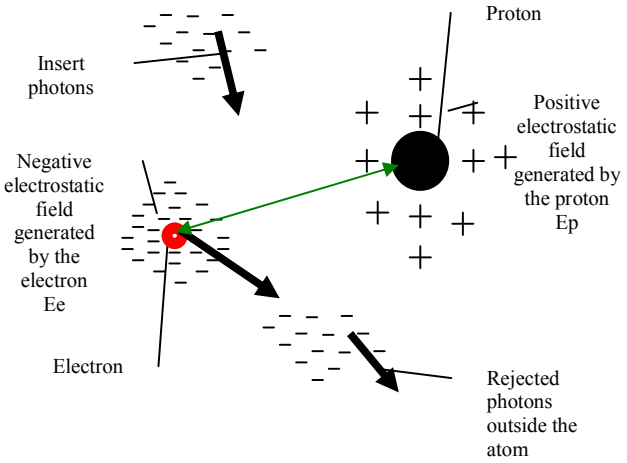


Fig. 3 Insert and rejected photons in hydrogen atom

On a larger material scale, the external controlled insertion of photons into a metal bar leads to the bar expansion and to the occurrence of several phenomena such as the phenomenon of redness, elimination of photons or outward elimination of the infrared radiation [4].



Fig. 4 Bar expansion by insert photons

Returning to the universe consisting of a single hydrogen atom and taking into account the aforementioned radiation theory in which photons have mass and negative electric charge infinitely small, the atom composition becomes:

- Proton
- Electron
- Photons or radiation of different wavelengths, respectively.

IV. Explanation of the Photoelectric Phenomenon

The definition of classical physics: the external photoelectric effect is the issue of electrons from matter after

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the absorption of radiation [5]. A metal surface exposed to a radiation flux can generate, under certain conditions, free electrons.

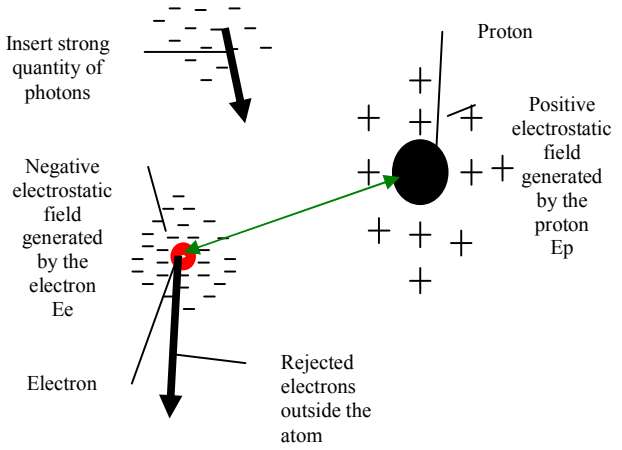


Fig. 5 Photoelectric phenomenon

According to the theory of this paper, namely that the photons have mass and negative electrostatic charge infinitely smaller than the electron, according to Fig. 5, inserting a large amount of photons inside the atom leads to the accumulation of a large amount of negative charges of photons, Qf respectively, which can practically free electrons from the upper layers of the atoms.

V. Connection between the Radiation Wavelength and Mass and Negative Electrostatic Charge of Photons

According to the theory and physical experiments, the radiation is characterized by different wavelengths [4].

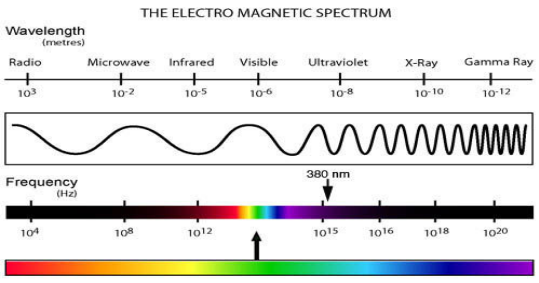


Fig. 6 Radiation wavelength

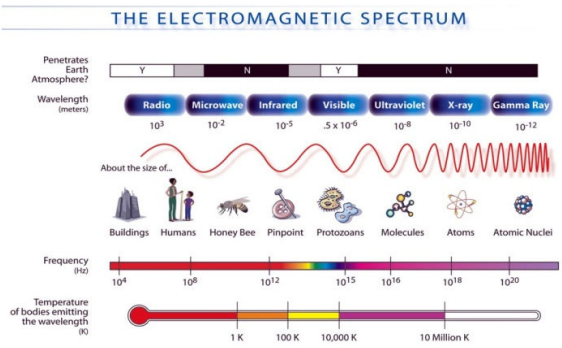


Fig. 7 Wavelength (meters) – frequency (Hz)

According to the electromagnetic radiation spectrum shown in Fig. 6, it is found that the wavelengths of radiation relative to the atom size cover both the subatomic and the external range of the atom [6].

According to the theory of this paper, namely that photons have mass and negative electrostatic charge infinitely smaller than the electron in conjunction with radiations electromagnetic spectrum and with the duality theory in physics, wavelength - corpuscle, it follows that the photons mass and charge vary from one photon to another.

Referring to the subatomic level, as shown in Fig. 7 presenting the electromagnetic spectrum of radiation, the photons located near the proton have mass and negative electrostatic charge higher than the photons near the electron or outside the atom.

Depending on the mass and negative electrostatic charge, the photons stabilize at different levels of rotation around the proton.

$$R = f(mf, Qf) \quad (6)$$

The more photons rotate on the energy levels closer to the proton (gamma radiations) the more their energy increases.

$$E_{f\,gamma} = m_{fgamma}\, c^2 \quad (7)$$

The release of the radiations inside the atoms, including high energy radiations such as X-ray or gamma ray occurs in case of thermonuclear reactions. In this case, by compressing the electrons towards the proton of the hydrogen atom and by forming the neutron, the whole amount of radiations from the atom is released outside.

From (4) it results:

$$\sum Qf = Qp - Qe \quad (8)$$

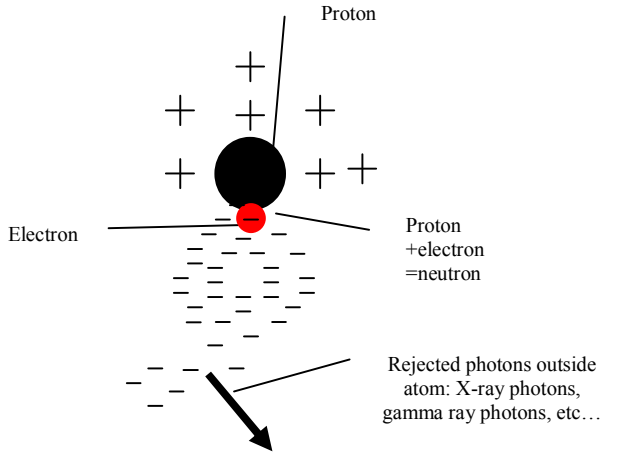


Fig. 8 Photons emission by thermonuclear reaction

According to Fig. 8 we can notice that all photons, regardless of wavelength, are no longer attracted by the proton. The photons, moving at light speed and having mass,

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will leave the path around the proton and will migrate outside the atom.

VI. Classification of Interaction Forces in Atoms by Considering Photons as Corpuscles with Mass and Negative Electrostatic Charge

In Figs. 9 and 10 it is presented the electrostatic model of gravity [1] between two and three hydrogen atoms including photons who's orbiting protons in the same time with electrons.

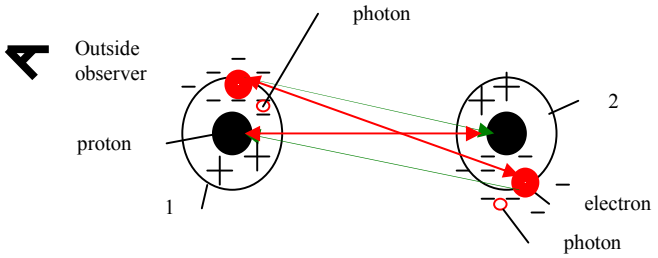


Fig. 9 Electrostatic model of gravity between two hydrogen atoms

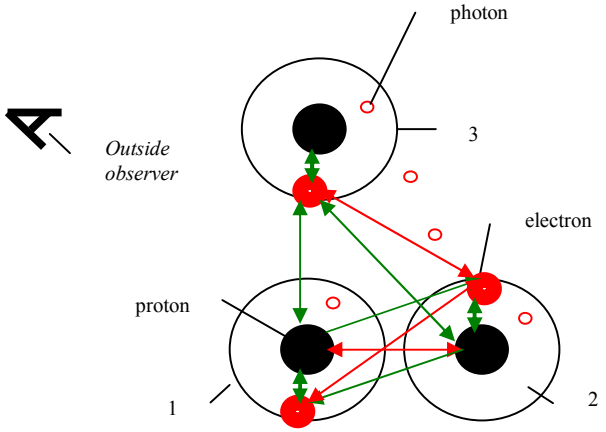


Fig. 10 Electrostatic model of gravity between three hydrogen atoms

Using the theory presented in this paper that the photons have mass and negative electrostatic charge and also considering the electrostatic model of gravity [1], the following types of forces are to be found in atoms:

1. Nuclear forces – are the electrostatic forces of attraction from nuclei consisting of proton, the forces of attraction between protons-and neutrons, namely between proton-electron-proton. Due to addition of the electron to the proton (neutron), the distances between the positive and negative charges are zero and consequently the attraction forces are very high.
2. Atomic forces – are electrostatic forces between the nucleus (protons) and the photons and electrons orbiting the atoms. The size of the attraction force is directly proportional to the distance between the nucleus and the photons and electrons.
3. Forces of chemical bonds between atoms – are the forces of electrostatic attraction between the nucleus of an atom (protons) and the electrons of neighboring atoms. The attraction force size is smaller than the atomic force due to the longer distance between the nucleus and the electrons of neighboring atoms.
4. Forces of gravity - are the forces of electrostatic attraction between the nucleus of an atom (protons) and the electrons of distant atoms. The size of the attraction force is much smaller than the force of chemical bonds between atoms due to the very large distance between the nucleus and the electrons of the distant atoms

Because photons have mass and negative electrostatic charge they modify continuously the size of total negative electrostatic field generated by photons and electrons who's orbiting nuclei (protons).

VII. Conclusion

According to the theory presented in this paper, respectively:

- Photons have a mass infinitely smaller than the electron and different between photons depending on the wavelength of the radiation;
- Photons cannot be absorbed by the electrons
- Photons have a negative electrostatic charge infinitely smaller than the electron;

theory verified by the following phenomena:

- Thermal expansion;
- Photoelectric effect;
- Thermonuclear reaction

in conclusion, the atom composition becomes:

- Proton
- Electron

and

- Photons or radiation of different wavelengths, respectively.

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