



Coulomb's Law Stand to The World of Elementary Particles in the Way That Newton's Laws of Classical Mechanics Stand to The Macroscopic World

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To Cite This Article: Yin Yue Sha. Coulomb's Law Stand to The World of Elementary Particles in the Way That Newton's Laws of Classical Mechanics Stand to The Macroscopic World. *Am J Biomed Sci & Res.* 2019 - 6(1). *AJBSR.MS.ID.000989*. DOI: [10.34297/AJBSR.2019.06.000989](https://doi.org/10.34297/AJBSR.2019.06.000989).

Received: 📅 October 05, 2019; Published: 📅 October 31, 2019

Abstract

According to the Classical Electron Orbital Radius and the force equilibrium relation before the disintegration of the neutron, we can calculate the sharp radius of the neutron; According to the density of nucleus and the sharp radius of the neutron, we can calculate the sharp radius of the electron; According to the sharp radius of the electron and the force equilibrium relation that electron with the Critical Photon, we can calculate the sharp electron radius of the Critical Photon; From the density of nucleus, we can obtain the mass of the Critical Photon; From the light velocity, we can obtain the energy of the Critical Photon; From the Planck's constant, we can obtain the frequency of the Critical Photon; From the light velocity, we can obtain the wavelength of the Critical Photon; We discover that the wavelength of the Critical Photon is in the peak position of the solar spectrum energy radiation. Coulomb's law stand to the world of elementary particles in the way that Newton's laws of classical mechanics stand to the macroscopic world.

Keywords: Neutron; Proton; Electron; Critical Photon; Mass; Radius; Frequency; Density

Introduction

One: The Disintegration of the Neutron

The neutron can spontaneously produce disintegration and turn into the proton, at the same time send out an electron and some matter. According to the force equilibrium relation, before the disintegration of the neutron, there was the formula as follows:

$$F = K \times Q_p \times Q_e / (R_n \times R_n) = (M_n - M_p) \times C \times C / R_n \quad (1)$$

Where the K is the electromagnetic constant; the Q_p is the electric charge of the proton; the Q_e is the electric charge of the electron; the M_n is the mass of the neutron; the M_p is the mass of the proton; the R_n is the radius of the neutron; the C is the light velocity.

The total mass for releasing from neutron disintegration is $M_n - M_p$ as follows:

$$M_n - M_p = 1.674927211(84) \times 10^{-27} - 1.672621637(84) \times 10^{-27} + 2.30557374(89) \times 10^{-30} \text{ kg}$$

$$M_n = 1.674927211(84) \times 10^{-27} \text{ kg}; M_p = 1.672621637(83) \times 10^{-27} \text{ kg}; M_e = 9.10938215(45) \times 10^{-31} \text{ kg}$$

where the M_n is the mass of the neutron, the M_p is the mass of the Proton and the M_e is the mass of the electron.

Two: The Radius of the Neutron

From formula (1), we can acquire the calculation formula of the neutron radius,

$$R_n = K \times Q_p \times Q_e / ((M_n - M_p) \times C^2) \quad (2)$$

According to exact physical constants from modern science, we take the following values:

$$K = 8.9875517873681768 \times 10^{-9} \text{ m} / \text{F}, Q_p = Q_e = 1.602176487(40) \times 10^{-19} \text{ C}, C = 299792458 \text{ m} / \text{s}$$

from formula (2), we can calculate the radius R_n of the neutron:

$$R_n = K \times Q_p \times Q_e / ((M_n - M_p) \times C^2) = 1.11337558(48) \times 10^{-15} \text{ m} \quad (3)$$

Three: The Frequency of the Neutron

From the radius of the neutron, we can compute the frequency of the neutron:

$$F_n = C / (2 \times \pi \times R_n) = 4.2854768(19) \times 10^{+22} \text{ 1} / \text{s} \quad (4)$$

Four: The Density of the Neutron

From the radius of the neutron, we can compute its density:



$$Dn = Mn / (4 / 3 \times \pi \times Rn^3) = 2.8972252(39) \times 10^{-17} \text{ kg / m}^3 \quad - \quad (5)$$

Five: The Radius of the Proton

According to the density of the neutron, we can calculate the radius of the proton:

$$Rp = (Mp / Mn)^{(1/3)} \times Rn = 1.11286448(48) \times 10^{-15} \text{ m} \quad - \quad (6)$$

Six: The Radius of the Electron

According to the matter density of neutron, we can calculate the radius of Electron:

$$Re = (Me / Mn)^{(1/3)} \times Rn = 9.0880914(40) \times 10^{-17} \text{ m}$$

Seven: The Radius of the Atomic Nucleus

According to the radius of the neutron and the density of matter, we can calculate the radius of the atomic nucleus:

$$Ra = (Ma / Mn)^{(1/3)} \times Rn \quad - \quad (8)$$

where the Ma is the mass of the atomic nucleus and Ra is the radius of atomic nucleus.

$Mu (Mu = 1.660538782(83) \times 10^{-27} \text{ kg})$ is the atomic mass unit and Ru is its radius.

$$Ru (Mu / Mn)^{(1/3)} \times Rn = 1.11017826(48) \times 10^{-15} \text{ m} \quad - \quad (9)$$

$$Ra = Ru \times A^{(1/3)} \quad - \quad (10)$$

where the A is the nuclear number of the atomic nucleus.

Eight: The Physical Constants of the Critical Photon

According to the radius of the electron and the density of the Neutron, we can calculate the mass of the Critical Photon and other Physical Constants:

$$2 \times Ro^2 + Ro^2 (Ro / (Re + 2Ro))^2 + 4 \times Re \times Ro - 2 \times Rceo \times Ro + Re^2 = 0 \quad - \quad (11)$$

$$Rceo = K \times Qp \times Qe / (Me \times C^2) = 2.8179402894(58) \text{ fm} \quad - \quad (12)$$

$$Rcp = 2 \times Ro; Ro = 0.0015674688(15) \text{ fm};$$

$$\text{Radius : } Rcp = 0.0031349376(29) \text{ fm}; \text{ Mass : } Mcp = 9.347546(38) \times 10^{-36} \text{ kg}$$

$$\text{Energy : } Ecp = 4.200578(17) \times 10^{-19} \text{ J}; \text{ Energy : } Ecp = 2.621795(11) \text{ eV};$$

$$\text{Frequency : } Fcp = 6.339471(26) \times 10^{14} \text{ Hz}; \text{ Wavelength : } \lambda cp = \lambda sha = 472.8982(20) \text{ nm};$$

Apply the Wien's law we can obtain:

$$Tsha = 2897768.5(51) \text{ nm} \cdot K / \lambda sha = 6127.679(37) \text{ K}$$

References

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