Neutrons synod as a cause of nuclear γ-radiation

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Abstract. The interpretation of γ-radiation at the nuclear decay is based on the structure of the nuclei, that is, on two fundamental phenomena. First, on the inverse electric field of the proton and second, on the electric entity of the macroscopically neutral neutron, which behaves, at the nuclear scale, as a positively charged particle. The γ-radiation at the alpha decay (e.g. in radio $^{226}_{88}Ra$) can occur due to the neutrons synod (session), which reduces the negativity of the nuclear field and attenuates the connection of a nucleus $^{4}_{2}He$ (alpha particle), that exits the parent nucleus with the whole energy without γ-radiation or with less energy but with γ-radiation. Also, a beta decay β^{-} can occur due to the neutrons synod in the nucleus (e.g. in boron $^{12}_{5}B$), resulting the emitted electron exits the parent nucleus with the whole energy without γ-radiation or with less energy but with γ-radiation. These strange phenomena will be explained.

Keywords: Neutrons synod; γ-radiation.

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1. General Appearance

According to the unified theory[1,2] of dynamic space the atomic nuclei[3,4] have been structured through two fundamental phenomena.[5] The inverse electric field[6] of the proton and the electric entity of the macroscopically neutral neutron.[7]

The structure of the nuclei begins with the so-called lower-order nuclei, as the deuterium $^{2}_{1}H$, tritium $^{3}_{1}H$ and helium $^{3}_{2}He$, which evolve into helium $^{4}_{2}He$[5] and then the first upper-order oxygen $^{16}_{8}O$,[8] that has four nuclei $^{4}_{2}He$ in a potential column of strong negative electric field.

So, the second upper-order calcium $^{40}_{20}Ca$[9] is based on the fundamental natural phenomenon of mirror symmetry, by repetition of the first upper-order oxygen nucleus and one half of it, i.e. at the 2.5 factor.

The same stands with the third upper-order tin $^{120}_{50}Sn$,[10] which emerged from the second upper-order calcium $^{40}_{20}Ca$, according to the mirror symmetry and the same 2.5 factor.

Additionally, the tin $^{120}_{50}Sn$ will further form the basis for the structure of all heavy nuclei up to the radioactive uranium $^{235}_{92}U$.[11]

Specifically, rhenium $^{187}_{75}Re$[11]

$$^{187}_{75}Re = ^{120}_{50}Sn + \frac{1}{2} \cdot ^{120}_{50}Sn + 6n + n \tag{1}$$

is constructed by one tin $^{120}_{50}Sn$, one half of it and six orbital bonding neutrons[8] are added, while one neutron added in deuterium $^{2}_{1}H$[5] (one half helium $^{4}_{2}He$) that evolves into tritium $^{3}_{1}H$[5] (located in the center of tin $1/2^{120}_{50}Sn$).

So, bismuth $^{209}_{83}Bi$[11]

$$^{209}_{83}Bi = ^{187}_{75}Re + 4^{4}_{2}He + 6n \tag{2}$$

is constructed from the addition of four nuclei $^{4}_{2}He$ and six orbital bonding neutrons adjacent to the corner potential column of rhenium $^{187}_{75}Re$.

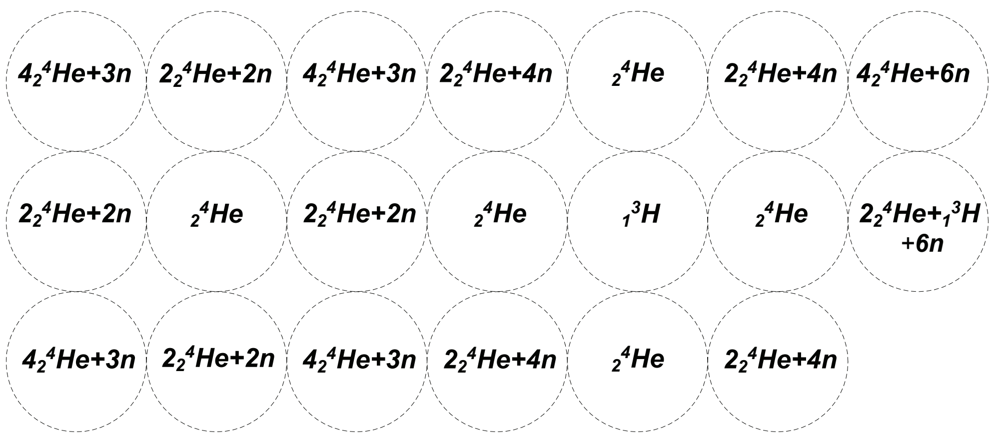

Figure 1. Radio $^{226}_{88}Ra$ is constructed from the addition of two nuclei $^{4}_{2}He$, one tritium $^{3}_{1}H$ and six orbital bonding neutrons[11] adjacent to the bismuth $^{209}_{83}Bi$ as a sensitive potential column (Fig. 3)

Furthermore, radio $^{226}_{88}Ra$ (Fig. 1)

$$^{226}_{88}Ra = ^{209}_{83}Bi + 2^{4}_{2}He + ^{3}_{1}H + 6n \tag{3}$$

is constructed from the addition of two nuclei $^{4}_{2}He$, one tritium $^{3}_{1}H$ and six orbital bonding neutrons adjacent to the bismuth $^{209}_{83}Bi$ as a sensitive potential column (Fig. 3).

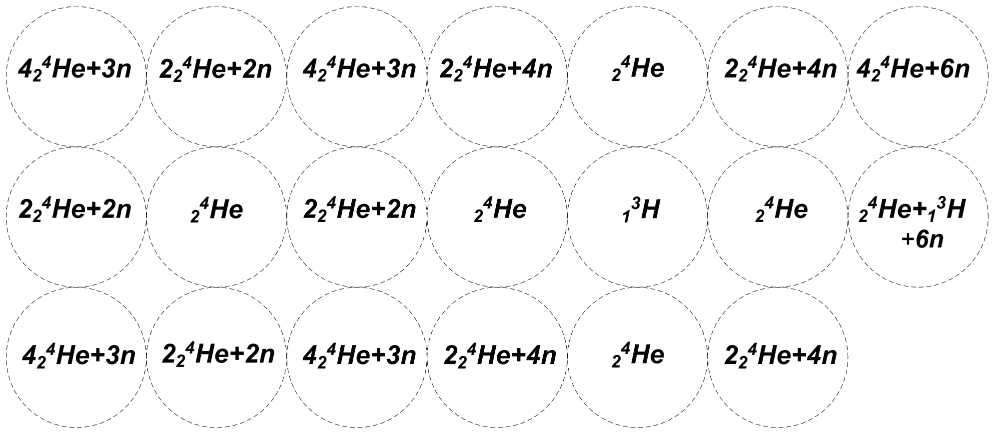

Figure 2. Radon ${}^{222}_{86}Rn$ is constructed from the addition of one helium ${}^{4}_{2}He$, one tritium ${}^{3}_{1}H$ and six orbital bonding neutrons adjacent to the bismuth ${}^{209}_{83}Bi$ as a potential column (Fig. 4)

Also, radon ${}^{222}_{86}Rn$ (Fig. 2)

$$ {}^{222}_{86}Rn = {}^{209}_{83}Bi + {}^{4}_{2}He + {}^{3}_{1}H + 6n. \tag{4} $$

is constructed from the addition of one helium ${}^{4}_{2}He$, one tritium ${}^{3}_{1}H$ and six orbital bonding neutrons adjacent to the bismuth ${}^{209}_{83}Bi$ as a potential column (Fig. 4).

That is the simple and elegant structure model, according to which the nuclei consist of fixed nuclei ${}^{4}_{2}He$ (plus deuterium ${}^{2}_{1}H$, tritium ${}^{3}_{1}H$ and helium ${}^{3}_{2}He$, all evolving into helium ${}^{4}_{2}He$) and neutrons rotating around of them.

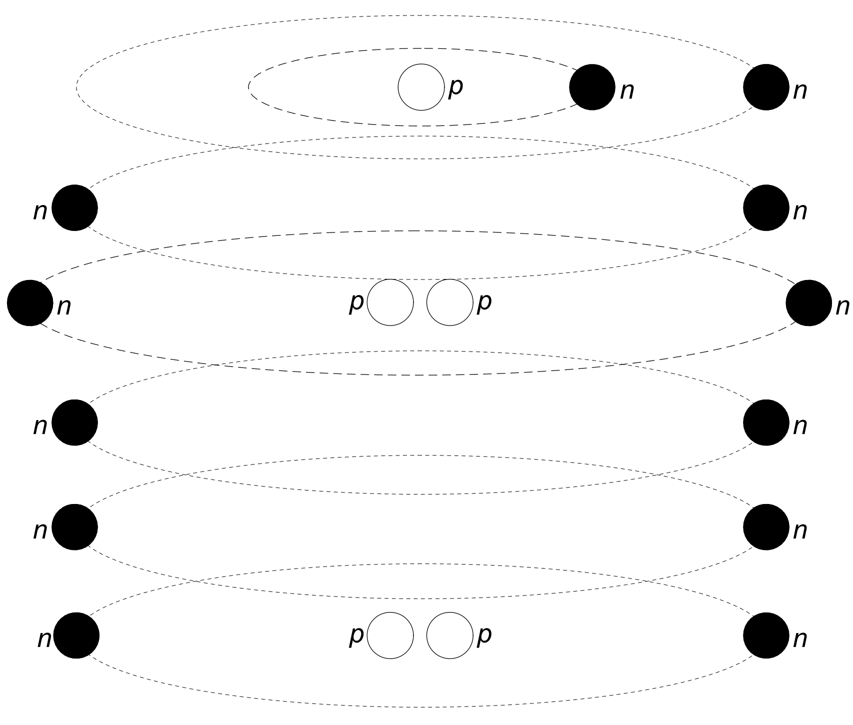

Figure 3. Sensitive potential column of radio ${}^{226}_{88}Ra$ (Fig. 1) is derived from two helium nuclei ${}^{4}_{2}He$, one tritium ${}^{3}_{1}H$ and six orbital bonding neutrons

As it is known, E/M radiation is emitted during the acceleration or deceleration of charged particles. Specifically, γ-radiation requires large accelerations and energies of charged particles. During the nuclear decay, the energy of the emitted γ-radiation is equal to the difference between the energies of the parent and daughter nucleus, after the energy of the decay particles is subtracted.

There is also a rearrangement of the nucleons or a displacement of a lower-order nucleus (e.g. ${}^4_2He$, ${}^3_2He$, ${}^3_1H$ and ${}^2_1H$) of the daughter nucleus, resulting in the emission of a γ-radiation, due to the large potential difference of the nuclear field and the large accelerations of the above nucleons.

Moreover, the energy difference between the parent and the daughter nucleus can be obtained entirely from the emitted particle, without the production of γ-radiation. However, when the emitted particle receives some of the above energy, then the rest of the energy is emitted as γ-radiation.

This strange phenomenon explained in the following subsections.

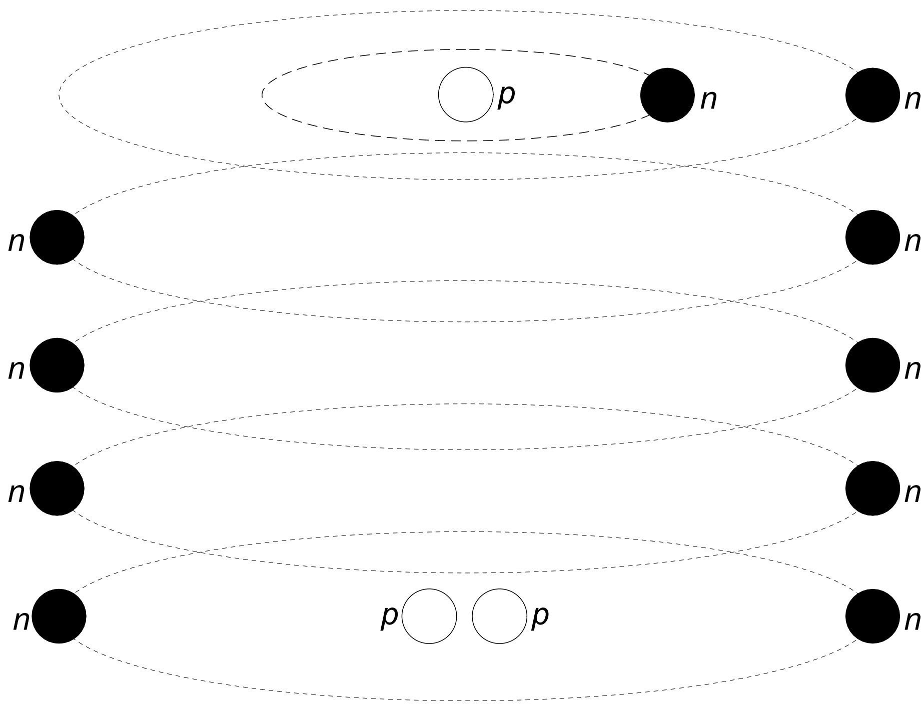

Figure 4. Potential column of radon ${}^{222}_{86}Rn$ (Fig. 2) is derived from one helium ${}^4_2He$, one tritium ${}^3_1H$ and six orbital bonding neutrons

1.1. Gamma radiation at the alpha decay

The phenomenon is explained by selecting the structure of the radio ${}^{226}_{88}Ra$, which decays to radon ${}^{222}_{86}Rn$ by emitting α-radiation during the reaction

$$ {}^{226}_{88}Ra \longrightarrow {}^{222}_{86}Rn + {}^4_2He + E_0. \quad (5)$$

The helium nucleus ${}^4_2He$ (alpha particle) exits the parent nucleus with the whole energy

$$E_0 = 4.78MeV \tag{6}$$

without γ-radiation or with less energy

$$E_1 = 4.59MeV \tag{7}$$

but with γ-radiation of an energy

$$E_2 = E_0 - E_1 = 4.78 - 4.59 = 0.19MeV \Rightarrow E_2 = 0.19MeV. \tag{8}$$

This strange phenomenon explained as follow:

It is therefore concluded that radio $^{226}_{88}Ra$ can emit one of the two nuclei $^{4}_{2}He$, e.g. the upper nucleus $^{4}_{2}He$ (Fig. 3), where a neutrons synod (session) in the sensitive potential column takes place, which reduces the negativity of the nuclear field and attenuates the connection of the above nucleus. Thus, with the emission of the upper nucleus $^{4}_{2}He$ (Fig. 3), which receives the total energy $E_0 = 4.78$MeV (Eq. 6), the potential column of the radon $^{222}_{86}Rn$ (Fig. 2) remains as in Fig. 4 without a structural rearrangement and without a γ-radiation.

However, if the neutrons synod occurs at the bottom of the above sensitive potential column, then the down nucleus $^{4}_{2}He$ (Fig. 3) with energy $E_1 = 4.59$MeV (Eq. 7) is emitted. The energy difference $E_2 = 0,19$MeV (Eq. 8) belongs to the remaining excited radon $^{222}_{86}Rn$, which is automatically rearranged due to the field configuration, shifting the remained nucleus $^{4}_{2}He$ to the bottom of the potential column (Fig. 4) with emission a gamma-radiation of energy $E_2 = 0,19$MeV (Eq. 8), that is due to the displacement of this charged particle $^{4}_{2}He$.

1.2. Gamma radiation at the beta decay β^-

Boron $^{12}_{5}B$[8] (Fig. 5) is derived from two nuclei $^{4}_{2}H_e$, one tritium $^{3}_{1}H$ and one orbital bonding neutron

$$^{12}_{5}B =^{4}_{2} H_e +^{4}_{2} H_e +^{3}_{1} H + n. \tag{9}$$

The unstable boron $^{12}_{5}B$ undergoes a beta decay β^-, the electron of which is emitted with energy

$$E_0 = 13.4MeV. \tag{10}$$

However, this energy may be divided into

$$E_1 = 9MeV \tag{11}$$

for the electron and

$$E_2 = E_0 - E_1 = 13.4 - 9 = 4.4MeV \Rightarrow E_2 = 4.4MeV \tag{12}$$

for γ-radiation. This strange phenomenon explained as follow:

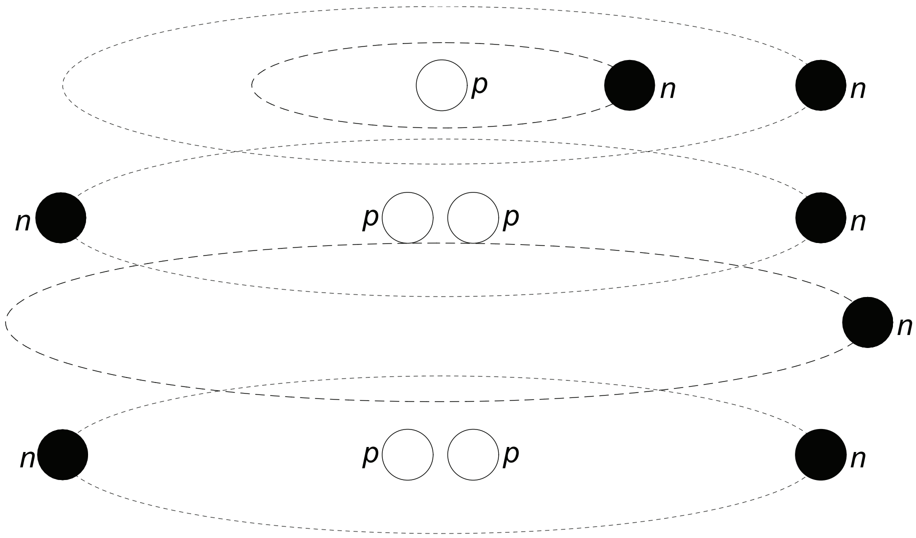

Figure 5. Boron nucleus ${}^{12}_{5}B ={}^{4}_{2} H_e +{}^{4}_{2} H_e +{}^{3}_{1} H + n$ is derived from two helium ${}^{4}_{2}H_e$ nuclei, one tritium ${}^{3}_{1}H$ and one bonding neutron

At the top of potential column of the boron ${}^{12}_{5}B$ (Fig. 5) a four neutrons synod (session) can occur, due to which the negativity of the nuclear field decreases, resulting in the beta decay β^{-} of the distant unstable neutron of tritium ${}^{3}_{1}H$, at the position of which rushes to take the orbital bonding neutron.

The above produced proton is immersed in the tritium ${}^{3}_{1}H$ and immobilized next to the other proton, forming a nucleus ${}^{4}_{2}He$, which, together with the other two ones, forms the carbon ${}^{12}_{6}C$ as a potential column of the three nuclei ${}^{4}_{2}He$ (Fig. 6).

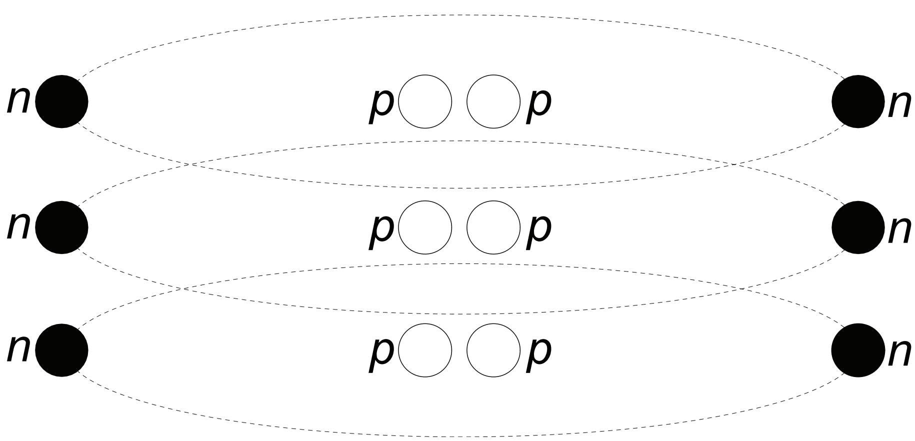

Figure 6. Structure model of carbon nucleus ${}^{12}_{6}C ={}^{4}_{2} H_e +{}^{4}_{2} H_e +{}^{4}_{2} H_e$ as a column strong electric field of three coaxial nuclei ${}^{4}_{2}He$

This displacement of the proton into the tritium ${}^{3}_{1}H$ occurs during the neutrons synod with the reduced negativity of the nuclear field and with a potential difference, which is not sufficient to generate gamma radiation. Therefore, the electron is emitted with the whole energy $E_0 = 13.4\text{MeV}$ (Eq. 10).

However, a three neutrons synod can occur at the bottom of potential column of the boron $^{12}_{5}B$ (Fig. 5), due to which the negativity of the nuclear field decreases, resulting in the beta decay β^- of the orbital bonding neutron. As the produced proton is immersed accelerated to the tritium $^{3}_{1}H$ emits γ-radiation and immobilized next to the tritium's proton, forming a nucleus $^{4}_{2}He$, which, together with the other two ones, forms the potential column of the three nuclei $^{4}_{2}He$ of carbon $^{12}_{6}C$. Thus, the electron emits part of the total energy, i.e. $E_1 = 9$MeV (Eq. 11), while the above produced proton generates γ-radiation of energy $E_2 = E_0 - E_1 = 13.4 - 9 = 4.4$MeV (Eq. 12).

Also, a gradual regression of the nuclei $^{4}_{2}He$ in the field columns may be occur, due to energy differences between these nuclei. This regression can be caused by any change in potential, resulting in the emission of a linear spectrum.

2. References

[1] N.I.Gosdas, *The Unified Theory of Dynamic Space*, Greek Edition (Trohalia, Athens, 1999).

[2] M.Tzoumpas, *Hubble's Law and antigravity - Higgs boson and gravity*, http://viXra.org/abs/1710.0082 [Quantum Gravity and String Theory].

[3] N.I.Gosdas, *The Structure of Nuclei* (chapter 4, pages 69-203), Greek Edition (SALTO, Thessaloniki, 2001).

[4] M.Tzoumpas, *Structure model of atomic nuclei*, http://viXra.org/abs/2001.0155 [Quantum Physics].

[5] M.Tzoumpas, *Structure model of helium nucleus* $^{4}_{2}H_e$, http://viXra.org/abs/2002.0340 [High Energy Particle Physics].

[6] M.Tzoumpas, *Inverse electric-nuclear field*, http://viXra.org/abs/1902.0266 (sections 1 and 2) [High Energy Particle Physics].

[7] M.Tzoumpas, *Structure model of atomic nuclei*, http://viXra.org/abs/2001.0155 (section 3) [Quantum Physics].

[8] M.Tzoumpas, *Structure model of oxygen nucleus* $^{16}_{8}O$, http://viXra.org/abs/2004.0145 [High Energy Particle Physics].

[9] M.Tzoumpas, *Structure model of calcium nucleus* $^{40}_{20}C_a$, http://viXra.org/abs/2004.0507 [High Energy Particle Physics].

[10] M. Tzoumpas, *Structure model of tin nucleus* $^{120}_{50}Sn$, http://viXra.org/abs/2005.0168 [High Energy Particle Physics].

[11] M. Tzoumpas, *Structure model of uranium nucleus* $^{235}_{92}U$, http://viXra.org/abs/2006.0143 [High Energy Particle Physics].