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RESEARCH ARTICLE

RECONSIDERATION OF THE TRANSFORMATIONS GENERATED BY BETA RADIOACTIVITY IN UNSTABLE ATOMIC NUCLEI

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ABSTRACT

Currently the beta radioactivity of unstable atomic nuclei is often associated with the nuclear weak force that manifests within two kinds of nucleons and in their immediate environment. The W^+ and W^-conveyed bosons serve as temporary particles and are of short existence during intermediate phases in the transformative changes. The new concept and detailed explanation of beta radioactivity, here proposed, appealed mainly to the physical phenomenon of the electric combination between quarks of the nucleons that are a priori spatially involved in this reaction. We therefore propose that an unbound solitary nucleon (due to instability) and moving inside the nucleus, gets close enough to the other type of nucleon. While it is established that the effects of reciprocal electrical combination show that the feasibility and thereof consequences are perfectly consistent with the results seen for beta radioactivity. The involved ubiquitous electric physical processes illustrate, it seems, the merits of this new simply physicist approach regarding the reconsidered transformation modes of beta radioactivity that are here mainly of electrical origin and consequences.

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INTRODUCTION

In the present physics of unstable nuclei components' beta radioactivity (nucleons and quarks) is often associated to the fundamental week interaction occurring internally of this particles' groups in nuclei. The sequence of conformal transformations seems to be relatively well established with the participation of conveyed bosons W^+ and W^-which serve as intermediates in the corresponding phases between nucleons (protons and neutrons) and their transformative changes in the concerned atomic nuclei. The here proposed beta radioactivity reconsideration appealed mainly to the physical phenomenon of the electric combination between the quarks and the nucleons spatially concerned in this reciprocal transformation typical reaction. This starting point of this new understanding lies on unstable nuclei where, *it is likely that a solitary migrant nucleon come in the immediate vicinity of the other type of nucleon,* which itself is alternatively connected the end of a chain (neutron, proton, neutron etc.)The effects of reciprocal electric combination between well adapted quarks vis-à-vis located, leads as will be shown here, the feasibility ultimately comply with the results of the beta radioactivity.

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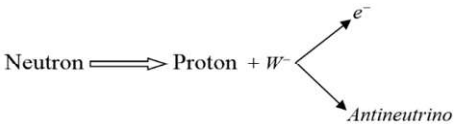
Thus, we shall find with physic simple explanations, based mainly on the electromagnetism, the final results recorded in both cases of this atomic reaction very special for the current physics. In the two chapters that follow, it is the migrant nucleon of one type, being opposite in vis-à-vis to the other type of nucleon, at the chain end, which will be transformed by this reaction. It should be noted that the W^+ and W^-bosons, said vehicles, are not, for the moment, directly involved in the two new processes that will be described and detailed here. With this new version with effects mainly electrical, the beta radioactivity it is likely that in the event a force would operate, it must be based on electromagnetism. If that were the case, it could, perhaps, be part of the unifying force between gravity and electrostatic force that has been developed and explained by Electromagnetic Elementary Force EVTD^2 in the recent work (Conte 2018) and in the preliminary bases (Conte 2006, 2017, 2018) where already was made such unification questions and it seems to be a priori solved. Therefore it is possible in this New Physics that *quite of similarities are highlighted for unification in the basic principles* and to an elementary simplification of this basic structure.

Transformation of a neutron in a proton by beta radioactivity new approach: In the present classic physics, the physic phenomena of *beta* radioactivity represent the passage, concerning the transformation of a neutron into a

proton by a W^- boson that seems to organize the two emissions: of the negative charge e^-, on one hand and, on the other hand of an electronic antineutrino. The generation of a neo-proton replacing the initial neutron is thus resulting.



So we will consider both conductors internal to the atomic nucleus: the proton and the neutron but, almost their compositions in trios of quarks *up (u)* and *down (d)* that are the less charged conductors presently admitted in atomic physics. The neutron is presented by the structure of quark trio $d(-1e/3)$ $u(+2e/3)$ $d(-1e/3)$, while le proton is represented by $d(-1e/3)$ $u(+2e/3)$ $d(-1e/3)$. The transformation process driving to the result is here composed of four phases parallel or successive. The essential starting consideration is about a non-fixed neutron, delocalized inside an atomic nucleus, relatively unstable (necessary condition for beta radioactivity existence). Also in this nucleus are protons and neutrons well stabilized and alternatively well-structured in chains. So we could think that *an unstable neutron is migrating and thus moving with a certain speed through a semi free proton at the chain end* (of neutrons-protons). The *u* and *d* quarks of each arrive face to face and thus, there is more electric attraction since the different *u* and *d* attract each being of opposite polarity, which increases the initial approximation between the proton at the chain end and the migrant neutron. From a relatively closed vicinity, the electric combinations between the different constituting quarks can be fully and completely. It remains only to describe the corresponding effects such initiated by different conjunctures took into account in the four further considered cases.

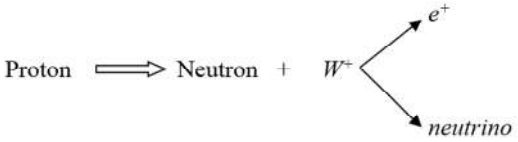
Electric combination of the migrant neutron on the proton at the chain end: The electric combination of the migrating neutron $(+1e/3; -2e/3; +1e/3)$ with the proton at the chain end by each of its quarks respectively adding on the proton itself $(+2e/3; -1e/3; +2e/3)$ will give for each conductor quark $(+3e/3; -3e/3; +3e/3)$, hence the global sum of e^+ that cannot be consistent with the structure and the charge of quarks. This unconventional electric charges repartition is surely unstable and thus it could be decomposed, for example, as: the antineutrino $(+1e/3; -2e/3; +1e/3)$ and the reestablished proton $(+2e/3 ; -1e/3; +2e/3)$.

Electric combination of the proton at the chain end on the migrant neutron: This other electric combination is simultaneous with the previous (of the first phase A) and thus there is the conjugated combination $(-2e/3; +1e/3; -2e/3)$ superposing on the migrating neutron's repartition and giving as sum $(-3e/3; +3e/3; -3e/3)$, i.e. globally e^-. This global charge e^- could be divided into two elements which could be issued out of neutron: on one hand $(-2e/3; +1e/3; -2e/3)$, equivalent to a global charge e^- (*this is the charge proved to be emitted for the case of beta radioactivity*) and, on the other hand, a zero electric charge which could be a neutron or a neutrino $(-1e/3; +2e/3; -1e/3)$. Therefore, the antineutrino from the phase A and the neutrino of this phase B are simultaneously emitted and thus they could annihilate and both vanish.

Electric combination of the in chain neutron neighbor of the proton at the chain end on this last one: It remains to consider the effects of the electric combination of the neutron in chain on its neighbor placed at the chain end. But before this phase, as to find the final result, we must take into account the effect of the proton at the chain end combination on its neighbor neutron. So, this neighbor neutron would have its charge increased by $(-2e/3; +1e/3; -2e/3)$, which will give it the global charge of $(-3e/3; +3e/3; -3e/3) = e^-$. Thus, the combination effect on the proton at the chain end will give to it a global charge of e^+, i.e. $(+3e/3; -3e/3; +3e/3)$, which can result as in the first phase A in a proton and an antineutrino. These last ones will add to what is remaining on the photon at the chain end, i.e. the reestablished photon, because the first antineutrino would be annihilated by the neutrino from the second phase B. Ultimately, from the combination of the three previous phases will remain two charges and structures equivalent to two protons on this nucleon: the proton at the chain end.

Last phase: the contact between the migrant neutron with the proton at the chain end: Finally the migrant neutron will have a zero charge (i.e. it can be assimilated to a neutron) and it will continue to get closer to the proton at the chain end till contact. So, *it could get one* of the two electric positive charges that would be organized as proton configuration and *thus transforming the migrant neutron in proton. The second positive charge will remain on the original proton at the chain end and thus it will be reestablish in its conformity*. Thus the beta radioactivity result, giving the transformation of a neutron in proton, was represented only by effects of reciprocal electric combinations inside the unstable atomic nucleus without interference of any force deriving from the weak force. Being so, *then there will be electric repulsion between neo proton and proton at the chain end and the reaction is completed*, whence end of the beta radioactivity.

Transformation of a proton in a neutron by beta radioactivity new approach: The transformation of a proton in a neutron by beta radioactivity is considered in present physics as the action of a W^+ boson giving more a neo neutron instead a migrant proton, the e^+ elements and a neutrino. This transformation is represented by:



For this second case we shall proceed to the same algorithm as the previous transformation of a neutron in a proton. We shall tray again to propose a simple physic phenomenon' sequence. They are expected to reach the end result duly noted of this second type of beta radioactivity. It will be again taking into account the electric combination effects of each of the charged or global neutral conductors that are placed in a suitable neighborhood and are useful for mapping of this radioactivity. So we will study, similarly, in four phases, the reciprocal effects of the electric combination on the migrant proton this time and. the first two neutron-proton at the chain end in an unstable atomic nucleus. Therefore analogous, in such atomic nucleus, an unfixed moving proton would approach a neutron at the chain end (proton-neutron alternately linked) such that the quark trios are in vis-à-vis.

Thus the various reciprocal electrical combinations between the various quarks face-to-face, can be effective and analyzed in the following four paragraphs, which show the four stages of this supposed transformation into beta radioactivity.

Electric combination of the migrant proton n on the neutron at the chain end: When the migrant proton is close enough to the proton at the chain (neutron-proton- etc.) end the combination with the neutron in each of its quarks is given by (*–2e/ 3;+1e/3;–2e/3*), which is adding to quarks of the neutron itself (*–1e/3;+2e/3;–1e/3*). This modifies the charge of each conductors quarks and gives (*–3e/ 3;+3e/3;–3e/3*). So, on the neutron at the chain end will be the global sum in value of e^-, which is not in conformity with the quarks charge. This nonconventional repartition of the electric charges is surely unstable. Therefore it could be decomposed, for example, as follows: the equivalent of a neutrino with the charge *0e* = (*–1e/ 3;+2e/3;–1e/3*) and the emerging antiproton (*–2e/3;+1e/3;–2e/3*) = e^-.

Electric combination of the at neutron the chain end on the migrant proton: This electric combination is simultaneous with the previous (A) and thus there is the conjugated composition of the neutron (*+1e/3; –2e/3; +1e/3*) that is superposing on the combination repartition of the migrant proton, giving as sum (*–3e/ 3;+3e/3;–3e/3*) which means a global charge of e^+. This could be divided in two elements, which could be emitted outside the migrant proton in form of: on one hand (*+2e/3; –1e/3; +2e/3*), equivalent to a global charge of e^+ (*this one can represent the charge e^+ observed as emitted from the atomic nucleus in the case of beta radioactivity*) and, on the other hand, a *zero electric charge that could be an antineutrino*(*+1e/3; –2e/3; +1e/3*). Therefore the antineutrino of this phase and the neutrino of the previous phase A, are emitted simultaneously and *they could annihilated and vanish each other from the reactive environment itself*. Following these two phases, *it remains present only the antiproton on the neutron at the chain end the ex-migrant proton do not have any global electric charge*.

Electric combination of the in chain proton neighbor of the neutron at the chain end on this last one: It remains to consider the electric combination's effects of the proton in the chain immediately neighbor to neutron at the chain end on this last one. This represents the case as in the phase A: so, on the neutron will be a global charge of (*–3e/ 3;+3e/3;–3e/3*). This one could be divided and concretized in the same two elements as in A: an antiproton (*–2e/ 3;+1e/3;–2e/3*) = e^- and a neutrino 0*e* = (*–2e/3;+1e/3;–2e/3*). So this neutrino would be emitted in the space, which will confirm a part of the effective observation in classical physics on this second order beta radioactivity. So, it remains only the antiproton that would add to those already remaining from the phase A and, giving two antiprotons on the neutron at the chain end. This last global charge would be equivalent to (*–4e/ 3;+2e/3;–4e/3*) = $2e^-$. A relatively important electric charge of $2e^-$ would have a good chance to make an electric combination with the ex-migrant proton that became electrically neutral (after the phase B) and, in this new conjuncture it will charge with the conjugated value of $2e^+$, i.e. it will have, finally, a charge of (*+4e/3;–2e/3;+4e/3*).

Last phase: the contact between the migrant proton with the neutron at the chain end: Ultimately, on the migrant proton will remain an electric charge opposite to those of the neutron at the chain end (phase C), wherefrom the possibility of a direct contact of these two charged conductors, especially because they are symmetrical and relatively intense. Therefore, these charges will annihilate (ex-migrant proton and the neutron at the chain end) and both will remain electrically neutral. Their structures in quarks trio is held and their global charges will be equal to zero. Therefore, it may be estimated a possible action on the two components of these two neutrons. One is already the primary neutron at the chain end and, *it becomes necessary that the ex-migrant proton to be transformed in a new-neutron*. The global balance of these different electrical combinations shows that the transformation of a neutron creates the appearance of a neutron as well as the emission of an e^+ charge and of a neutrino, as shows the classical physics. Ultimately, *the repulsion will occur between the two neutrons, due to their quarks' systems*. Thus the final result of beta radioactivity, giving the proton transformation in a neutron, was again represented only by the reciprocal electrical combinations inside an unstable atomic nucleus. It is to mention that the W^+ boson does not directly interfere in this new beta radioactivity approach but, it is not forbidden for it to play a role in all these electrical rearrangements during the different mentioned transformation phases.

Conclusion

As part of this new conception of beta radioactivity, which has been described here, it appears that it could initiate from the phenomenon of electrical combination between charged conductors, globally (proton) or otherwise in their intimate compositions of quarks (the neutron and the proton). The deductions made from these consequences properly give the duly recognized results by the current physics. Bosons W^+ and W^- are not directly and necessarily used in this reagents combos approach in this beta radioactivity reconsideration. They would, it seems, a pseudo-catalysts role in the reactive process: in fact they have an exceedingly short lifetime. The processes between physical phenomena that are mentioned here are sufficiently clear but very fast in relation to actual use of *W* bosons in the sequences of related reactive changes. If a force is participating in this beta transformation one can think that it is based on electromagnetism (viewing the guiding principles of this new conception) and, it could be conjugated with the new unitary force – the Primary Electromagnetic Force EVTD^2 (Conte 2018, 2006, 2017, 2018) that is omnipresent in the entirely quanta space-time (dimension and time) structured in energetic entities EVTD^2.

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