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Neutrons in Gravitational Field

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Abstract
The radius r in neutron's "astronomical" system between its electron and proton as the shortest radius in the universe is in harmony with the shortest range of the large astronomical radius R of the Sun at its center where the key for understanding the behavior of neutrons in gravitational field is the ratio $\frac{r}{R} = 1.91 \times 10^{-18}$. where the greatest energy of the electron in neutron $(2.2\ Mev)$ is also in harmony with the strongest gravitational field of the Sun, it is worth noting that 2.2 Mev energy means more than four times the speed of light! For this reason individual neutrons are settled forever in the center of gravity of the Sun or of that of Milky Way galaxy where neutron stars are concentrated in its center.
On the other hand, neutrons far from the center of gravity at long range of R in relatively weak gravitational field keep existing as neutrons by dividing their 2.2 Mev energy between two protons one of them is the proton in the neutron itself as it is the case of the nucleus called deuteron and that of double deuterons where alpha 4 with two electrons divide their energies among four protons, also the neutron keeps existing by dividing its energy among three protons as it is the case of the stable alpha 3.
Individual neutrons, on our Earth, inside nuclear range emit their electrons with different energies, and outside nuclear range they emit them after about 15 minutes because the radius r between the electron and proton in individual neutrons cannot be kept forever far from the strongest field of gravity in its center as the harmony between r and R is now missed. For this reason free neutrons in Nesvishensky's experiment tend to go upward , even where the pull of gravity on the neutrons in this experiment had been slowed down to the lowest degree being smaller by more than a trillion trillion times !
Key words : neutrons – gravitational field – electron's energy – protons – deuteron – alpha 3 – alpha 4

Introduction:
Nesvishenesky's experiment on free electrons had been performed to prove that gravity is quantized like electromagnetic or nuclear energy but it led to finding that neutrons do not response naturally to the law of gravity , this result comes in harmony with the constant we reached to between the radii of the small and large astronomical systems in the universe where the neutron with its short radius r between its electron and its proton is in harmony only with the short value of R the radius of large astronomical system, in other words neutrons are in harmony with the strongest gravity in the center of the Sun or galaxy but not in relatively weak gravity like that on the earth. Therefore, in the strongest gravity the neutrons are settled without emitting their electrons or without their electrons are obliged to distribute their energies between two or three protons as what happens on our earth.

1- What constant $\frac{r}{R} = 1.91 \times 10^{-18}$ is ?

This ratio between the small and large astronomical systems in the universe is the key to understand the behavior of neutrons in gravitational field,
In previous articles we came to constant U[1] that describes the behavior of an electron interacting with another charged particle as follows:

$$m_e v^2 r = \frac{e^2}{4\pi\varepsilon_0} = 2.30 \times 10^{-28}\ J - m \qquad [1]$$

Finding, that any objet supposed to orbit the Sun at its hydrogen surface moves with the same velocity of an electron orbiting a proton at fifth and last level of energy in hydrogen atom[2], this finding led me to put $\frac{GM_{sun}}{R}$ for v^2 in the above constant which describes in the same time the neutron's system, and the result was the ratio $\frac{r}{R} = 1.91 \times 10^{-18}$, where according it, at the surface of the Sun we have actually the hydrogen atoms with their radii at fifth and last level of energy before the electrons are free from the attraction of protons in the last layer above hydrogen surface called corona, the value of the radius r of every hydrogen atom from $\frac{r}{R}$ is as follows:

$$r = 1.33 \times 10^{-9} m.$$

And actually in the layer above the hydrogen surface of the Sun the electrons are free from protons in the plasma state known as corona.

2- Neutrons take place forever in the strongest gravity:

On the other hand, the settled neutrons exist in the center of the Sun forming the small neutron star discovered by Oliver Manuel[3] where the radius of every neutron between its electron and proton is half the radius of the smallest nuclear entity on the earth called deuteron, because the electron here on the Earth is obliged to divide its energy $2.2\ Mev = 3.52 \times 10^{-13} j$ into two equal parts between two protons one of them is the proton in the neutron itself creating the deuteron , and for this reason to determine the basic nuclear radius on our Earth r_0 using constant U we have to divide this energy into two equal parts as follows

$$\frac{\frac{2.30 \times 10^{-28} j - m}{3.52 \times 10^{-13}}}{2} = 1.30 \times 10^{-15} m. = r_0 \quad [2]$$ [4]

But in a strong gravitational field as that in the neutron star in the center of the Sun the electron inside the neutron *does not need* to divide its energy that way, and therefore the radius of the neutron there according to this calculation is $6.53 \times 10^{-16} m.$ or $\frac{1}{2} r_0$

Therefore, from $\frac{r}{R}$ we can determine the range of the small neutron star in the center of the Sun as follows:

$$R = \frac{6.52 \times 10^{-16}}{1.91 \times 10^{-18}} = 341.36\ m. \quad [3]$$

3- Free neutrons outside nuclear range:

The experimental team of Institute Laue Langiven in Grenible (ILL) led by Nesvishensky[5] headed to prove that gravity is governed by quantum theory like electromagnetism and nuclear energy, the slow moving neutrons in this experiment used to fall due to gravity only, and these neutrons have to have a certain minimum energy equal to 1.41×10^{-12} electron volts, the neutrons were shot between two parallel plates one above another and separated by about 25 micrometers , half a hair width. Peter Geltenbort said that if there is a deviation by the neutrons in the measurements about their gravitational behavior then it would be a hint that Newton's gravity on these short distances is not 100% valid[6] As mentioned above in this experiment, the pull of gravity on a neutron is smaller by more than a trillion trillion times. The key for understanding this behavior is our ratio $\frac{r}{R}$ where the free neutron far from the center of gravity of the Sun tends to go upward as its distance r between the electron and proton is not in harmony with the range of R at the center of gravity in the solar system , therefore emitting its electron after a while and not affecting by the weak gravity of the Earth , this behavior or that are understandable in the light of the mentioned ratio $\frac{r}{R}$ .as follows:

a- The radius r in neutron tends to be larger with the larger range of R on the Earth, and this leads to that the electron is emitted from the neutron being inside nuclear range with different energies, or being outside the nuclear range after about 15 minutes.

b- The very fast neutrons with their original 2.2 Mev energy (meaning as passed more than four times the speed of light) find a strength of gravity at the center of the Sun or the galaxy overcome their resistance to its pull and keep them as individual neutrons forever , but in relatively weak gravity like that on the Earth their resistance to gravity is very great to the degree that although their energy had been reduced to $1.41 \times 10^{-12}\ electron\ volt$ in Nesvishensky's experiment , the gravitational pull on them was as mentioned incredible in its smallness!

4- Neutrons in the solar system:

Our Sun lies about 8Kpt from the center of the Milky way which extends from the center to about 30 Kpt (about 100,000 light years[7] ,therefore our location from the center of the galaxy is not very far , and this gives the chance for the neutrons to formed partially in addition to hydrogen atoms in the solar system, and the formation of nuclear star in the core of the Sun where the gravity is at its greatest strength is fully understood according to the mentioned ratio $\frac{r}{R}$

Conclusion:

The key for understanding the behavior of neutrons in gravitational field is the ratio $\frac{r}{R} = 1.91 \times 10^{-18}$ that deduced from U constant. When the radius r of the neutron as the smallest astronomical system in the universe and the radius R of the solar system are at their minimum value in the center of the Sun, then the energy of both of them are in harmony, and the individual neutrons are kept in the core of the Sun as a neutron small star or in that of Milky way galaxy as a group of neutron stars, but at larger range of R as on our Earth the electron in neutron either :

a- divides its 2,2 Mev between its proton in the neutron and other proton forming the nucleus called the deuteron and its double called alpha 4 where r has double its original value, or the electron in the neutron distributes its energy among three protons in the stable alpha 3

b- The individual neutron breaks down inside the nuclear range emitting its electron with different value according to the value of r in this state , or breaking down outside nuclear range after about 15 minutes. In these two states the radius of the individual neutron r "tries" to match the long value of R in the mentioned ratio $\frac{r}{R}$ and at last the electron is emitted from the neutron.

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