Hidden Global Energy of the Universe

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Is the total energy measurable in the universe? I found this question on the Internet www.quora.com. No one answered this question. The **zero-energy universe** hypothesis proposes that the total amount of energy in the universe is exactly zero: its amount of positive energy in the form of matter is exactly canceled out by its negative energy in the form of gravity [1, 2]. But is it really so? I have the opposite opinion. New physics in the form of the quantum theory of Superunification gives us new knowledge about the universe and its energy [3]. The theory of Superunification is physics on the contrary. The Standard Model (SM) of physics has a zero energy level of cosmic vacuum. The theory of Superunification, on the contrary, establishes the maximum energy level of the cosmic vacuum. This maximum energy level is due to the quantized space-time structure which consists of quantons. Quanton has a small diameter (Leonov's length) and it consists of four quarks: two electrical ±e and two magnetic ±g [4]. Such a system of quarks makes it possible to calculate the energy accumulated in it. We multiply the energy of one quanton by the quantum density of the medium [5] and obtain the energy accumulated in one cubic meter of space vacuum which is equivalent energy to the mass of the substance of the whole universe. These energy values are incomparable. So, the calculations showed that 100% of the energy is accumulated inside the quantized space-time. This is the hidden global energy of the universe.

Keywords: hidden energy, quarks, quanton, quantized space-time, Leonov's length, quantum density, Standard Model, theory of Superunification.

We find the energy of a quanton from its structure (Fig. 1 and 2).

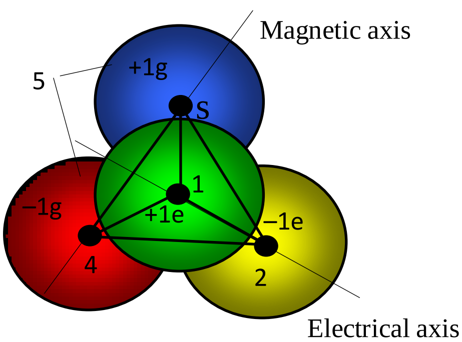

Fig. 1. The electromagnetic quadrupole (top view).

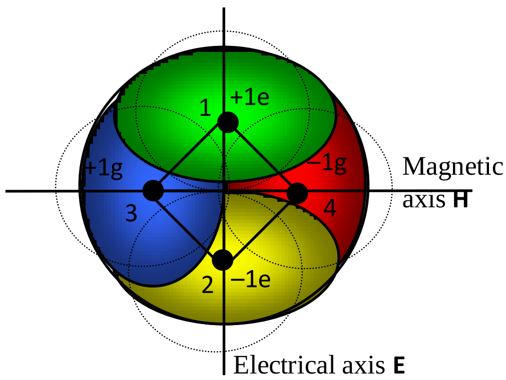

Fig. 2. The quanton in projection (rotated in space).

Quanton includes two electrical ±1e and two magnetic ±1g quarks. The distance r_{oe} and r_{og} between the electric and magnetic quarks is half the diameter of the quanton L_{qo} [4]:

$$r_{eo} = r_{go} = 0{,}5L_{qo} = 0{,}37 \cdot 10^{-25}\,\text{м} \tag{1}$$

The energy of a quanton is equal to the sum of its electric W_e and magnetic W_g provided that $\varepsilon_o\mu_o C_o$=1 and (1):

$$\begin{cases} W_e = \dfrac{1}{4\pi\varepsilon_o}\dfrac{e^2}{r_{eo}} = 0{,}62\cdot 10^{-2}\,J \\ W_g = \dfrac{\mu_o}{4\pi}\dfrac{g^2}{r_{go}} = 0{,}62\cdot 10^{-2}\,J \end{cases} \qquad (2)$$

As indicated by (1), the energies of interaction of the electrical quarks and the magnetic quarks inside the quanton are equal to each other and their sum is equal:

$$W_q = W_e + W_g = 1{,}2\cdot 10^{-2}\,J \approx 10^{17}\,eV \qquad (3)$$

We can estimate the energy capacity w_{qv} of the quanton on the basis of the accumulated total energy W_q (3) related to its volume V_q:

$$w_{qv} = \frac{W_q}{V_q} = 6\frac{W_q}{\pi L_q^3} = 5{,}7\cdot 10^{73}\,\frac{J}{m^3} \qquad (4)$$

The energy (4) in one cubic meter of space vacuum is equivalent to the energy of the mass of the entire Universe. The concentration of electromagnetic energy (4) inside the quanton is colossal and cannot be produced artificially in order to break the electrical and magnetic bonds inside the quanton. If the energy of the quanton is reduced to the volume of the nucleon (proton), we obtain the value of the order of $1.6\cdot 10^{28}$ J/nucleon or 10^{47} eV/nucleon. This energy is comparable only with the limiting energy of the proton when the latter reaches the speed of light [1]. In reality it is not possible to reach these energy concentrations in accelerator systems. This means that the quanton is the most stable particle in the universe and is not capable of splitting into free monopoles and determines the stability of the space-time.

The diameter of the universe is approximately equal to 10^{25} m and, in comparison with the diameter of a quanton 10^{-25} m, has a symmetric scale:

$$10^{25}\,m \rightarrow 0 \rightarrow 10^{-25}\,m \qquad (5)$$

We find the total electromagnetic energy W_U of the universe by multiplying the energy capacity w_{qv} (4) of the quanton by the volume $\pi D^3/6$ of the universe, taking into account its diameter D $=10^{25}$ m:

$$W_U = w_{qv}\cdot \pi D^3/6 = 3\cdot 10^{148}\,J \qquad (6)$$

So, we calculated the total energy W_U of the universe ~ $3\cdot 10^{148}$ J (6). This energy (6) is not comparable with the mass (4) of the universe. The calculations showed that 100% of the energy is accumulated inside the quantized space-time. This is the hidden global energy of the universe [3].

References:

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