

## THE PROBLEM OF THE EXCEPTIONAL DURABILITY OF A PROTON EXPLAINED

A proton is the most durable, non-elementary material structure which was created by nature.

What is the reason for this?

According to Model 31, there are two carriers of elementary charges, an electron and proton. An electron is a carrier of an elementary electric charge and elementary magnetic charge. These charges are indestructible. A proton is a carrier of an elementary gravitational charge so its charge is indestructible as well. Since elementary charges are indestructible, their carriers must be also indestructible. Indestructible means here that this is not a subject of a natural decay.

**Neither natural decay of an electron has ever been reported, nor natural decay of a proton will ever be reported.**

This is a fundamental law of physics.

Since a proton is a composite particle, we can ask about the source of such exceptional durability of its components connections.

According to Model 31, a proton is formed from electrons and positrons (see the note SYMMETRY BETWEEN MATTER AND ANTIMATTER CONFIRMED. ANTIMATTER FOUND!); the electric and magnetic poles of electrons and positrons in a proton are in as small as possible distances. They cannot connect because they vibrate with different frequencies, moreover the connection of the poles means their zero distance from each other, which, according to Coulomb's law,

$$F \sim \frac{x_1 \times x_2}{r^2}$$

would mean an infinitely great force of attraction.

If the distances between the poles are as small as possible, the electric and magnetic forces connecting the electrons and positrons are maximum possible. In order to demonstrate the scale of these forces, we will make a few simple calculations. We showed in the note UNIFORMITY OF THREE TYPES OF FIELDS that in the periodic table, the closest to the atom nucleus is the electron neutralizing the first proton in the nucleus of uranium.

**Its distance from the nucleus calculated from the classic Coulomb's law is  $1.09 \times 10^{-14}$  m. This is the exact distance.** It results from the same above mentioned note that the first proton and electron in the uranium atom attract each other with the force of

$$F = 2,31 \times 10^{-28} Nm^2 \times \frac{1}{1.09 \times 10^{-14} m} \times \frac{1}{1.09 \times 10^{-14} m} = 1,94 N$$

This force is already impressive but let us go further. An electron in a neutron is closer to a proton than the above mentioned  $1.09 \times 10^{-14} m$ , but the specific distance is not known. Let us assume that an electron in a neutron is 10 times closer to a proton ( $1.09 \times 10^{-15} m$ ) than the first electron in the uranium atom. This means that the attraction force of a proton and electron in a neutron is 100 times greater and equals 194 N. In positronium, which forms a proton, an electron and positron are closer to each other than in a neutron, but the specific distance is not known. Let us assume that they are 10 times closer ( $1.09 \times 10^{-16} m$ ). This means that the electrostatic attraction force of a positron and electron in positronium is 19400 N. This order of magnitude is close to the real one and means that the attraction force of an electron and positron in a proton is about 10000 times greater than the above mentioned attraction force of the closest to the nucleus of the first electron in the uranium atom.

We can illustrate the above in a different way. Experimentally determined ionization energy of the first electron in the uranium atom is 131820 eV, therefore the energy necessary to break "the binding" of an electron and positron should be 10000 times greater ( $131820 eV \times 10000 = 1\ 318\ 200\ 000 eV$ ). This is why a proton, although being a composite particle, has so great durability (which is legendary among the intellectuals).

As it is apparent from the above, physicists can recognize a decay of a proton only when they manage to create a voltage from several hundred million to a thousand million volts. Such a voltage will tear a proton to pieces (electrons and positrons), which will later change into gamma radiation having energy 0,511 MeV. This will be a direct evidence that a proton is formed from positrons and electrons. Such a high voltage cannot be created by a human. However, in nature there is a process capable of creating in a short time voltages of the order of several hundred million volts. They are atmospheric discharges commonly known as lightnings. It should be checked whether lightnings are not associated with gamma radiation having energy 0,511 MeV. It was relatively recently discovered that some of the discharges (probably the most energetic ones) are associated with such elements.

*Teruaki Enoto and all, Photonuclear Reactions in Lightning Discovered from Detection of Positrons and Neutrons, [arXiv: 1711.08044v1](https://arxiv.org/abs/1711.08044v1) [astro-ph.HE], 22 November 2017*

This phenomenon is completely incomprehensible for the modern physics, but for Model 31, this is a powerful evidence of the validity of its assumptions.