ЎЗБЕКИСТОН РЕСПУБЛИКАСИ ФАНЛАР АКАДЕМИЯСИ МИНТАҚАВИЙ БЎЛИМИ ХОРАЗМ МАЪМУН АКАДЕМИЯСИ

ХОРАЗМ МАЪМУН АКАДЕМИЯСИ АХБОРОТНОМАСИ

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A NEW LOOK AT THE STRUCTURE OF THE NUCLEUS AND ATOM

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Annotatsiya. *Elektromagnit to'lqinlar paketining elektromagnit to'lqin va energiya sifatida diskretligi va dualizmi ochiladi, ya'ni elektronlar va boshqa to'lqinlar holatiga qarab elektromagnit to'lqin paketi yoki energiya bo'lishi mumkin.*

Massa dunyodagi yagona zarradir, neytron va proton massa va elektromagnit to'lqinlar paketining hosilalari, shuningdek manfiy, musbat zaryad va gamma to'lqinlar atom, proton va neytron orbitalida aylanadi. molekulyar, proton, neytron aloqalarini hosil qiladi.

Kalit so'zlar: *diskretlik, dualizm, elektromagnit to'lqin paketi, massa, atom birligi massasi, neytron, proton, proton bog'i, musbat zaryad, proton va neytron spini.*

Аннотация. *Выявлены дискретность и дуализм электромагнитного волнового пакета как электромагнитной волны и энергии, т.е. электроны и другие волны могут быть электромагнитным волновым пакетом или энергией в зависимости от состояния.*

Предполагается, что масса является единственной частицей в мире, нейтрон и протон являются производными массы и электромагнитного волнового пакета, а отрицательный, положительный заряд и гамма-волны преобразуются на атомных, протонных и нейтронных орбиталях с образованием молекулярных, протонных, нейтронных связей.

Ключевые слова: *дискретность, дуализм, электромагнитный волновой пакет, масса, атомная единица массы, нейтрон, протон, протонная связь, положительный заряд, спин протона и нейтрона.*

Abstract. *The discreteness and dualism of the electromagnetic wave packet as an electromagnetic wave and energy are revealed, i.e. electrons and other waves can be an electromagnetic wave packet or energy depending on the state.*

It is proposed that the mass is the only particle in the world, the neutron and proton are derivatives of the mass and electromagnetic wave packet, as well as negative, positive charge and gamma waves are transformed in the atomic, proton, and neutron orbital to form molecular, proton, neutron bonds.

Keywords*: discreteness, dualism, electromagnetic wave packet, mass, atomic unit mass, neutron, proton, proton bond, positive charge, proton and neutron spin.*

Nuclear physics studies phenomena that occur at short distances with very high energies per unit.

The size of an atom is 10^{-10} m, and therefore nuclear physics is the physics that studies atomic phenomena, the shape of atomic nuclei, as well as the shape of electromagnetic phenomena, the main properties of the quantum world is the connection between nucleons and electromagnetic waves. The main quantities characterizing the wave are the frequency (γ), and the wavelength λ; in addition, there is also the direction of its propagation - the wave vector.

As is known from the physics course, vibrations of an atomic nucleus have a size of the order of 10^{-12} m, this is the value of a wave with spiral radiation (Figure 1) [1].

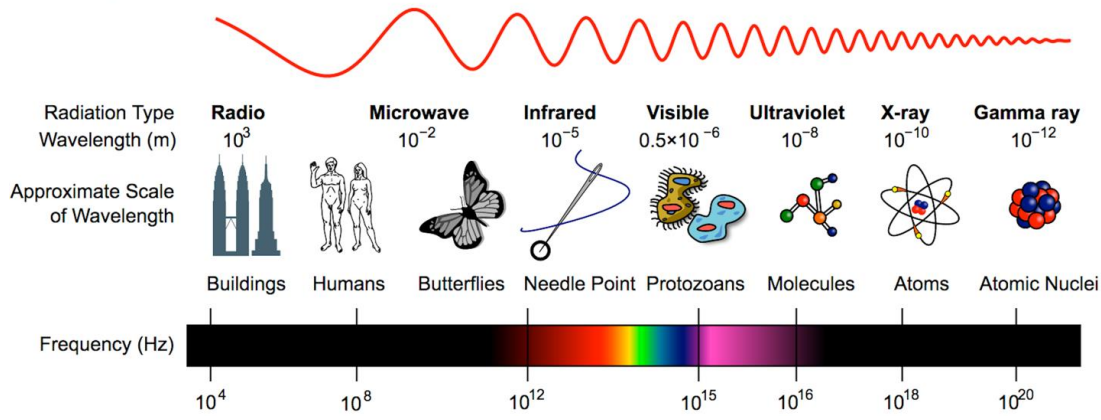


Figure 1. Radiation form of waves of different frequencies

In Figure 1. at 10-7 - 10-12 m an open, continuously threaded electromagnetic wave is depicted, that is, an open wave that has attenuation properties and does not meet the requirements of discreteness and dualism of electromagnetic wave as well as time stability. Using the properties of these waves, we will construct an electromagnetic wave packet (EMWP): **a closed, continuous, uniform, stable, stationary existence of energy in a free state.**

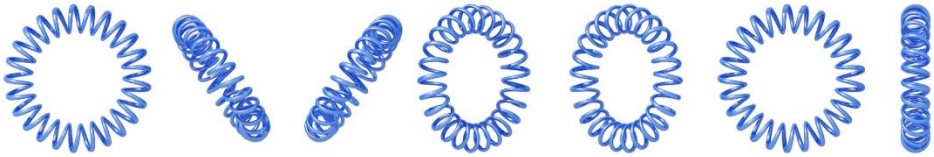


Figure 2. Propagation of a light beam as an EMWP

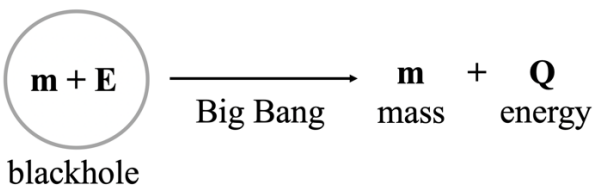
As can be seen from the above images, according to our theory, the electron and other electromagnetic waves are discretely closed, continuous, uniform, stable, stationary configurations with different frequencies, which determines their long wave character, for example, a light wave (Figure 2).

Thus, the discrete waves of a light beam have one direction, but each wave can independently change direction, and when it encounters an obstacle, the closed wave is reflected or destroyed, which leads to the absorption of the wave by that object. Absorption of a wave leads to a change in the energy of the object since the wave emits its energy when a closed EMWP is destroyed.

On this basis, we can conclude that the electromagnetic wave does not have particle-wave dualism, but the dualism of electromagnetic wave and energy, i.e. EMWP can be energy or electromagnetic wave depending on its state. As indicated in the article, all EMWPs are discretely closed, continuous, uniform and stable, stationary states of energy. Chemists divide the electron into different pieces during hybridization, and physicists divide positive and negative charges into pieces (quarks), which does not correspond to the simple laws of physics. According to our theory, the division of EMWPs is impossible, since they are closed, continuous, uniform, stable and stationary in orbit, and if not influenced from outside the EMWPs, they can stably cover light years. When exposed to external influence, the EMWP is destroyed, thereby being absorbed by the object in the form of energy.

There is a neutron in the nucleus, but how does the neutron work and what is its nature? The neutron has a spin, as well as the lifetime of the neutron in a free state.

Many natures of the neutron have been determined - the Compton wavelength is $1.32 \cdot 10^{-15}$ meters, and the electrical radius is 0.1149 f.m (negative). The neutron consists of a heavy centre with a radius of $r=0.25 \cdot 10^{-15}$ m. The mass of the neutron is $1.67492749804 \cdot 10^{-17}$ kg 1.00866491595 atomic mass unit (a.m.u.), approximately 0.1378% more than the mass of the proton. In a free state, the lifetime of a neutron is $\tau = 880 \pm 0{,}9$ seconds, the gravitational radius is $2.48 \cdot 10^{-54}$ m. The neutron is heavier than the proton. In nuclear experiments, a neutron lives for approximately 880 seconds. This phenomenon reduces everything to uncertainty, that is, the neutron is destroyed in a free state. If the neutron is destroyed, it means there is still something indestructible, otherwise, there is no constant - the constant basis of the world, **which means the basis of the world is a constant of mass**; constant - 1 atomic mass unit. ***m***-mass is an elementary physical fundamental quantity, which is equal to the standard mass number a.m.u., mass - from *Latin* - lump, chunk, piece, fundamental quantity of measurement of an elementary particle.



m – mass, E – highly compressed energy

Figure 3. Big Bang diagram

Figure 4. Mass

The atomic nucleus consists of neutrons and protons. To understand these particles, we need to consider the Big Bang mechanism.

With a big explosion, a mass and energy medium is formed, of extremely low density with high temperature - energy Q (Figure 3).As the temperature in the medium decreases, the formation of EMWP from energy begins, and it interacts with the mass and forms a neutron and proton.

The material world consists of two components, the primary basis is mass-neutral, indivisible, with high density, small volume and a stable particle at very high temperatures.

Mass (neutral) – indivisible matter of high density with the smallest particle size.

There is mass in the core - this is an indivisible part of matter, which is the primary basis of all particles (Figure 4), the secondary basis is energy with various characteristics. Mass is a homogeneous particle and does not consist of quarks; its derivatives are neutrons and protons.

According to the classical theory, the quark structure of a neutron is determined by the bound state of three quarks, that is, one "upper" (u) and two "lower" (d) and therefore written udd-quark structure.

The quark structure of the neutron decays in a free state, how to understand this destruction? How the energy basis - a neutron can be destroyed remains a mystery. If a neutron is destroyed, then there is no constant in the world.

Let's try to answer these riddles with logical concepts of physics.

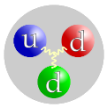


Figure 5. The quark structure of the neutron

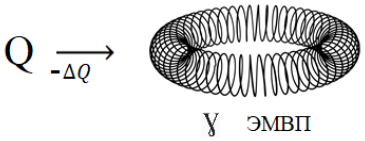


Figure 6. Education ɣ – EMWP

As can be seen from the figure, the quark structure of the neutron is one u - a quark and two d - quarks and it is stipulated that the u - quark consists of two 1/3 positive charge, as well as each d - quark of one 1/3 negative charge, which does not correspond to physical laws (Figure 5) [2].

Just as three quarks are placed in a critically small volume of a neutron, then one u - quark has two 1/3 positive charges, if so, just as during β-decay one whole e-electron is split off from the neutron, where does this electron come from when in two d - quarks each have 1/3 negative charge, and it totals 2/3 of the negative charge, the question arises where does 1/3 of the negative charge inside the neutron come from? Let's try to explain this phenomenon without using quarks.

After the Big Bang, the temperature begins to drop, which leads to the formation of EMWP in an endothermic process. Gamma EMWP is primarily formed with very high energy (Figure 6).

The resulting ɣ - EMWP interaction with the mass forms a neutron (Figure 7.).

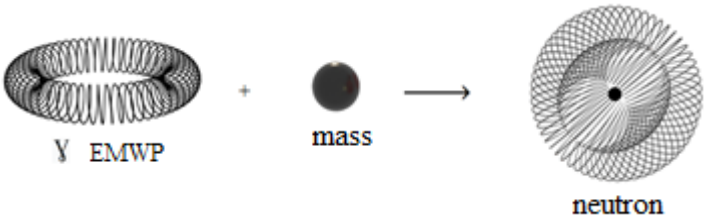


Figure 7. Formation of a neutron

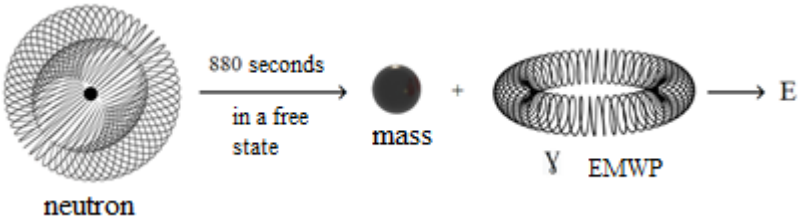


Figure 8. Neutron destruction

As can be seen from the above diagram, the neutron is also a derivative of mass and the ɣ-EMWP wave; a uniform, continuous, stable, stable distribution of this wave packet with transformation around the mass in a stationary orbital is called a neutron. Now we can understand

that the destruction of the neutron in free condition actually occurs; the time of the destruction of the neutron is 880 seconds - this is the time the gamma wave is released as an energy state from the neutron (Figure 8).

This means that the neutron is destroyed into mass and energy. The resulting mass cannot be recorded experimentally, because the gravitational size of the mass is very small and neutral. This once again confirms that the neutron is a derivative of mass and energy. According to literature data, the neutron has a spin, since spin is a way of connecting the electromagnetic field with the transformation in nucleon orbitals (Figure 9.), as bonds forming the properties of the gamma wave electromagnetic field.

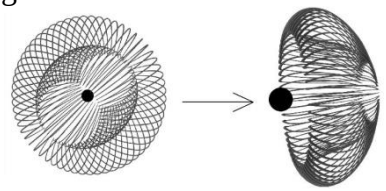


Figure 9. Transformation of the neutron gamma orbital

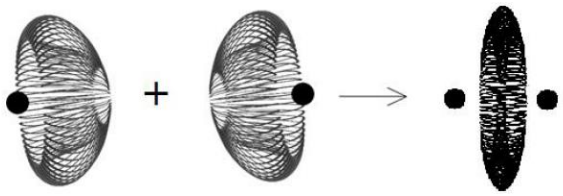


Figure 10. Formation of neutron bonds

Since the neutron also has a spin, it is possible to form a bond between two neutrons with opposite spins (Figure 10), thus there is no need for a gluon during the formation of atomic nuclei. Thus, using EMWP, one can easily explain the formation of a bond between identical electromagnetic waves (i.e. electrons, protons, neutrons, etc.). The difference in the masses of a neutron and a proton can be explained by the fact that the mass of a neutron is approximately 0.1378% greater than that of a proton, which means the gamma EMWP of a neutron by mass is greater than the EMWP of a proton when recalculating energy per mass.

Now let's try to describe the positive charge of the EMWP. A positive charge is a spiral-shaped, closed, continuous, uniform and stable stationary EMWP in a free state (Figure 11).

Figure 11. Formation of EMWP of a positive charge of a positron

This means that a positive charge of an electromagnetic wave packet is formed from energy. A wave having a right-hand threaded movement along the axis of the spiral determines the charge in the electromagnetic wave packet (EMWP), which has a spiral, closed, continuous, uniform and stable stationary state called **a positive charge - positron**.

A closed spiral EMWP in a proton is transformed, highly compressed, stable, continuous, and uniform in a stationary state.

This **EMWP** is a method of energy conservation in spherical, hemispherical and sectoral spherical configurations in the nucleus and atom.

EMWP has a charge and a spin. The definition of charge was given above; spin is the vector direction of movement in the spiral of an electromagnetic wave packet; if the vector direction of movement occurs counterclockwise, it has a right magnetic moment (Figure 12) and in the case of a vector direction of movement clockwise, it has a left magnetic moment of a positive charge (Figure 13.).

Figure 12. Right-hand thread EMWP of positive charge with right-hand magnetic moment (+), (S)

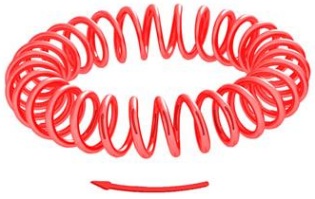


Figure 13. Left thread EMWP positive charge with left magnetic moment (-), (N)

Let us consider the formation of a hydrogen nucleus: the nucleus consists of a mass around which there is an EMWP of a positive charge, the size of which is several orders of magnitude larger than the size of the mass in a highly compressed state.

The primary nucleus of the hydrogen atom is formed from a particle of mass surrounded by an EMWP of a positive charge with transformation - let's call it a proton.

This wave packet is distributed with transformation around the mass, evenly, continuously, and stably in a stationary orbital, and a proton is formed (Figure 14).

mass **EMWP positive charge of a positron** **proton**

Figure 14. Formation of a proton

The positive charge of the proton is a transformed EMWP with a right-hand threaded movement with a closed spiral, with a continuous and uniform, stable and stationary orbital over the mass. What forms a proton is also a derivative of mass and energy.

The atom has an outer orbital with a negatively charged electron emp.

Let us consider the external electromagnetic field of an electron with a negative charge of the atomic orbital.

Let us denote the negative charge as a left-handed, spiral-shaped EMWP, differing in size by 104 times larger than the positive EMWP of the proton.

EMWP of a negative charge in a free form can be represented as a closed, continuous, uniform, free wave (Figure 15).

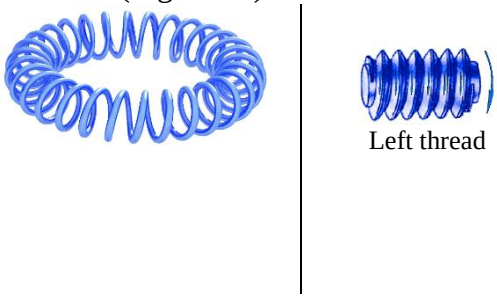
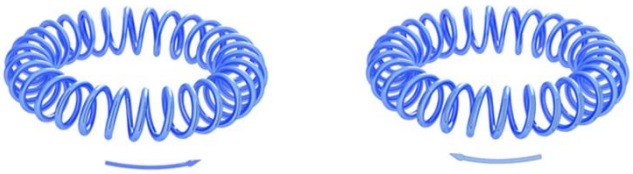


Figure 15. Left-thread free EMWP electron



EMWP with a counterclockwise vector - right magnetic moment **(+), (S)**

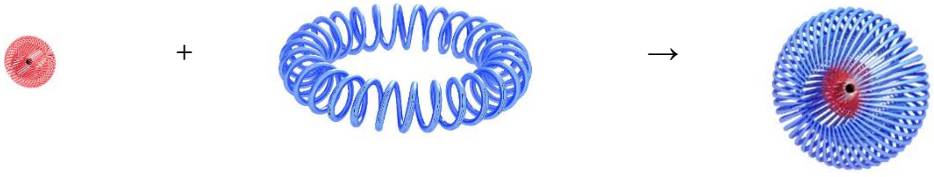
EMVP with a counterclockwise vector – left magnetic moment **(-), (N)**

Figure 16. Spins EMWP of negative charge

In turn, an EMWP with a left-handed spiral thread can have a vector directed clockwise or counterclockwise, which is the right-handed or left-handed magnetic moment of the electron (Figure 16).

Consequently, the electron should be considered not as a material point and not as an electron cloud in space, but as an EMWP having a spiral, closed, continuous, uniform, stable configuration.

Next, the resulting proton interacts with the negative charge of the EMWP and forms an atomic orbital of hydrogen (Figure 17).



Proton **EMWP of a free electron** **Hydrogen atom**

Figure 17. Formation of a hydrogen atom

The hydrogen nucleus consists of a neutral center of mass and an EMWP-positive charge around it, which has very high energy in a compressed state. On it, the electron magnetic field transforms to form the orbital of a hydrogen atom.

We discussed the wave packet with right-handed spirals and we call them positive charges around the mass, and if the vector is directed counterclockwise it is right-handed and clockwise it is left-handed magnetic moment.

This EMWP electron with transformation is distributed around the closure proton, uniformly, continuously, stable, and stationary; this is the atomic orbital of hydrogen (Figure 17).

In the nucleus, interactions arise between nucleons with positively charged protons, holding each other with opposite spins, and over time, the formation of the elements D, T and He begins.

$m_1^0 + EMWP^+ \rightarrow p_1^+;\ p_1^+ + EMWP^- \rightarrow (p_1^+\ e^-)$ **H - hydrogen**

$p_1^+ + n_1^0 \rightarrow p_1^+ n_1^0;\ p_1^+ n_1^0 + EMWP^- \rightarrow (p_1^+ n_1^0\ e^-)$ **D - deuterium**

$p_1^+ n_1^0 + n_1^0 \rightarrow p_1^+ n_2^0;\ p_1^+ n_2^0 + EMWP^- \rightarrow (p_1^+ n_2^0\ e^-)$ **T - tritium**

$p_1^+ n_2^0 + p_1^+ \rightarrow p_2^+ n_2^0;\ p_2^+ n_2^0 + 2EMWP^- \rightarrow (p_2^+ n_2^0\ 2e^-)$ **He - helium**

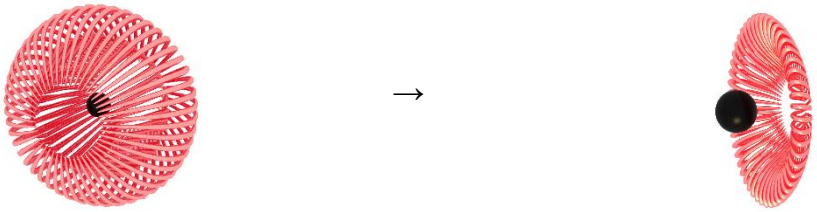
m_1^0 - *mass*
$EMWP^+$ *-positron*
p_1^+ - *proton*
n_1^0 *-neutron*
$EMWP^-$ *- electron*
e^- - transformed EMWP in atomic orbital

Thus the formation of the elements as we know them continues. Now it is paradoxical to understand how two quarks of identical positive charge can exist in such a small volume as in a helium nucleus.

In the nucleus, interactions occur between nucleons with the formation of a **proton bond** between positively charged positrons with the transformation of opposite spins and stably hold each other.

The helium nucleus contains four particles, two of them positive and two neutral. The two positive charges must repel each other in the nucleus, but they are held stable, how is it possible to understand this?

Here the theory of transformation of EMWP of proton orbitals will help us, that is, two proton orbitals are separately transformed into a hemispherical orbital from a spherical one with a right spin (Figure 18).



Proton with spherical orbital → proton with hemispherical orbital

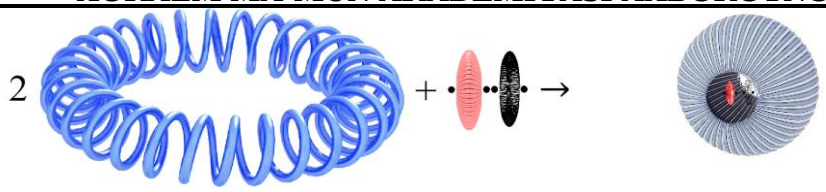
Figure 18. Transformation of proton orbitals of EMWP with right spin

right spin + right spin → pairing of two proton orbitals with opposite spins—forming a proton bond

Figure 19. Formation of proton bond

Formation of hemispherical, transformed proton orbitals EMWP of a proton with the opposite spin, which binds in a nuclear cell to form a proton bond (Figure 19) [3].

As a result, they remain stable in a small volume of the nucleus, there is one problem: both protons have a right spin, but when two particles are turned mirror-like to each other, the spins become opposite. Thus, the transformed proton orbital of a positive charge forms paired proton bonds with the opposite spin; now they do not repel each other, but are stably held in the nucleus with a small volume, and the neutron is placed in the nucleus without obstacles (Figure 20).



$2e^-$ *2p+2n nucleus of Helium* *Helium atom*

Figure 20. Formation of a helium atom

Transformation of the EMWP of nuclear proton orbitals occurs in all elements with the formation of pair-proton bonds, if the serial number is even, all protons are paired, if odd, then one unpaired-spherical proton orbital and the remaining paired protons, and they do not repel each other, thereby ensuring stability in the core.

Based on the above information, the following postulates can be stated:

1. The form of discreteness of electromagnetic waves has been revealed, which was previously unclear. In this case, the positive charge (proton), negative charge (electron) and light waves (photon) should be considered not from the point of view of particle-wave dualism, but as a dualism of electromagnetic wave and energy, i.e. waves, can be an electromagnetic wave or energy depending on the state.

2. In the world there is a constant constant basis mass. One atomic mass unit (1 a.m.u.).

3. EMWP - electromagnetic waves are the way of existence, transmission and transformation of energy.

4. The mass has an EMWP orbital, and depending on the EMWP it can be a product such as a neutron or a proton, which has a closed, continuous wave function in a uniform, stable form and is a highly ordered electromagnetic wave packet and it is not divided into quarks with different charges, as well as does not hybridize with various pieces of electromagnetic waves of the electron.

5. Proton, neutronium EMWP of a spherical orbital is transformed, if necessary, into hemispherical orbitals with the formation of positive magnetic moments of proton, neutron orbitals, with the subsequent formation of proton and neutronium bonds.

Based on the above data, the following conclusions can be drawn:

1. The currently existing theories about the structure of the nucleus and the nature of bond formation do not fully describe all cases, and with the development of physics and chemistry, more and more special cases and exceptions appear - this is the theory.

2. The application of the theory of transformation of electromagnetic wave packets leads to a more accurate interpretation of the results of quantum chemical calculations and also makes it possible to calculate the volume of electromagnetic waves in an atom and chemical bonds.

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