

Principle of Construction of Atom and Molecule of Hydrogen

Anatoli Bedritsky

Abstract.

This article is opening the principle of orbital motion of electron around of a proton in atom of hydrogen and is opening the principle of an attraction of the nucleuses of atoms of a molecule of hydrogen up to the certain internuclear distance. This article also specify the reason of instability of deuterium atom (isotope of hydrogen).

Given article is a part of my project "The real theoretical physics on the basis of existence of an ether ". The real theoretical physics opens the essence of all physical phenomena, because they occur at interaction of an ether and elementary particles of a matter.

1 Essence of Ether and Elementary Particles

The mats - the smallest particles of an initial matter. The mats move with acceleration in different directions independently from each other in absolute emptiness and can collide among themselves. At collisions the mats change their direction and acceleration of motion. At collisions the mats can break, because of that the mats have different mass and the form with planes. The mats, having more spherical form, refer to spheremats, and the mats, having more long form, refer to longmats. The spheremats after collision have mainly rectilinear motion, and longmats mainly rotary motion around the centre of mass. At a congestion of longmats, they form elementary particles under action of the ether. The space in which are spheremats, represents the an ether. The ether is between elementary particles of atoms, bodies, gravibodies and in space of the Universe.

Elementary particles move in ether with acceleration as they consist from the mats, but when their inertial acceleration becomes equal to their ethereal deceleration, then the elementary particles are moving with velocity of limit.

The mats of the ether at passage through elementary particles reduce the acceleration and velocity, but at output - increase. Therefore, around of a nucleus of atom, the field is formed, which is characterized by momenta of the field in the direction to the nucleus, that represents the strength of the nuclear field.

2 Principle of Orbital Motion of Electron around Proton in Atom of Hydrogen

In the case of a circular orbital motion of an electron round a proton, its orbital velocity is uniform:

$$V_t = V_{t-1} = V_{t+1}.$$

But the vector of the orbital velocity constantly changes its direction. Such a motion is due to the fact that the vector of orbital velocity, V , consist of vector free velocity of rectilinear motion on tangent line to orbit of velocity V_{free} and consist of vector of field acceleration ΔV_{field} .

$$V = V_{\text{free}} + \Delta V_{\text{field}}$$

The vector of free velocity V_{free} at any given moment of time t consists of the vector of free velocity of previous moment of time V_{t-1} of free acceleration ΔV_{free} and of ether deceleration ΔV_{ed} .

$$V_{\text{free}} = V_{t-1} + \Delta V_{\text{free}} - \Delta V_{ed}$$

Thus, the velocity of orbital motion of an electron V , at any given moment of time, t is the sum of the following components:

$$V_t = V_{t-1} + \Delta V_{\text{free}} + \Delta V_{\text{field}} + (-\Delta V_{ed})$$

Since in the case of a circular orbital motion, $V_t = V_{t-1}$, therefore

$$\Delta V_{\text{free}} + \Delta V_{\text{field}} + (-\Delta V_{ed})$$

does direction of the motion on circular orbit.

Since the vector of the ethereal deceleration at a given time has the direction opposite to the vector of the orbital velocity at the same moment of time, the ethereal deceleration does not influence on changes of the direction of the orbital motion but only on the velocity of orbital motion.

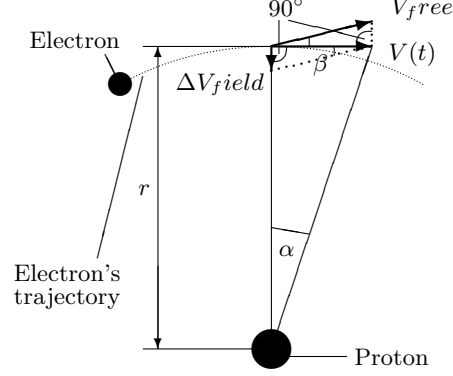


Figure 1: Circular orbital motion.

Fig. 1 shows the circular orbital motion of the electron round the proton in a single hydrogen atom, which have a steady condition. The velocity of circular orbital motion V consists of limited free (inertial) velocity of rectilinear motion (centrifugal motion) the V_{free} and the field acceleration (centripetal acceleration) ΔV_{field} . The vector of free velocity V_{free} has the free matic acceleration and the ethereal deceleration. If the electron would not have the free matic acceleration, then the electron would be attracted to the proton.

In the case $\alpha = \beta$ the orbital motion is circular and we see from the scheme in Fig. 1 that

$$\frac{R}{V} = \frac{V}{\Delta V_{\text{field}}}.$$

The radius of the circular motion of an electron is

$$R = \frac{V^2}{\Delta V_{\text{field}}},$$

where V is the velocity of the circular orbital motion of the electron and ΔV_{field} the field acceleration of the electron.

Having substituted value of ΔV_{field} (see article "Motion of elementary particles in ether field")

$$\Delta V_{\text{field}} = E \cdot s,$$

where E is the strength of the field of the proton, acting on the orbital electron located at the given orbit, and s the mobility of electrons.

Having substituted value of E (see article "Free motion of elementary particles")

$$E = \frac{M}{R^2}.$$

where M is the mass of the proton, R the radius of the electron's orbital motion.

Hence

$$\frac{R}{V} = \frac{V}{\Delta V_{\text{field}}} = \frac{V \cdot R^2}{M \cdot s}.$$

Hence the radius of orbital motion of electron on stationary orbit is

$$R = \frac{M \cdot s}{V^2}.$$

Nucleus of a steady atom of hydrogen it is proton, around of which the density of the ether does not differ almost from more distant surrounding ether is. The atom of hydrogen, as well as other atoms, can be in various energy conditions depending from etherization of the nucleus (a proton in atom of hydrogen), i.e. from absorption of different quantity of photons by the nucleus at a unstable condition of atom. At absorption of photons the density of the ether around of the nucleus is increasing, and at emission of photons the density is decreasing. The change of density of the ether around of the nucleus at absorption and emission of photons occurs discretely and thus electron passes on another orbit. At increase of density of the ether the orbital electron passes to higher orbit, where density of the ether such which was in a former orbit. The free acceleration ΔV_{free} remains former, and the field acceleration ΔV_{field} changes because of change of distance up to the nucleus. The density of an ether around of a proton increases at absorption by a proton of photons and in this case the proton is called a neutron.

For separate atom of the hydrogen which have a unstable condition, the strength of the field of the nucleus, acting on the orbital electron, is:

$$E = \frac{M}{\Pi}$$

where M is the mass of the nucleus (neutron), Π the density of ether, i.e. etherization, of given electron's orbit.

Hence

$$\Delta V_{\text{field}} = \frac{M \cdot s}{\Pi}$$

$$\frac{R}{V} = \frac{V}{\Delta V_{\text{field}}} = \frac{V \cdot \Pi}{M \cdot s}$$

Whence the radius of orbital motion of electron, being in a given orbit, having a certain etherization, is defined

$$R = \frac{V^2 \cdot \Pi}{M \cdot s}$$

The velocity of orbital motion of electron from fig. 1 is:

$$V^2 = V_{\text{free}}^2 - \Delta V_{\text{field}}^2$$

where V_{free} is the limit velocity of free motion of electron.

From article "Free motion of elementary particles":

$$V_{\text{free}}^2 = \frac{m \cdot s}{\Pi}$$

where m is the mass of electron, s is the mobility of electron, Π the etherization of given electron's orbit.

Hence

$$V^2 = V_{\text{free}}^2 - \Delta V_{\text{field}}^2 = \frac{m \cdot s}{\Pi} - \frac{M^2 \cdot s^2}{\Pi^2}$$

Since

$$\frac{M^2 \cdot s^2}{\Pi^2} \gg \frac{m \cdot s}{\Pi},$$

then

$$V^2 = -\frac{M^2 \cdot s^2}{\Pi^2}$$

$$V = -\frac{M \cdot s}{\Pi}$$

The impulse of orbital electron, or otherwise its energy, in the given orbit n is defined:

$$P_n = m \cdot V = -\frac{s \cdot m \cdot M}{\Pi}$$

Apparently, $s \cdot m$ represents the constant Ridberg ($2,18 \cdot 10^{-18} dg$), the mass M of the nucleus represents a so-called nuclear charge, and Π represents the main quantum number. Having accepted a designation n_e instead of Π , the formula of the velocity of orbital motion of electron will accept a known kind.

$$V = -\frac{s \cdot M}{n_e}$$

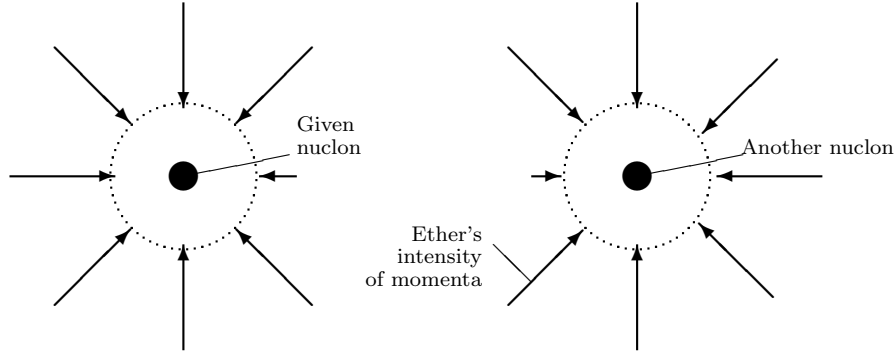


Figure 2: Mutual influence of nuclons.

3 Interaction of two Protons in Molecule of Hydrogen

In a molecule of hydrogen two protons are on such distance from each other, that they are in ethereal fields of each other. The ethereal field of a proton is directed from the outside in all directions to the center of the proton. Since ethermats of the ether at passing through a proton, is decreasing their strength of momentum, then the strength of momenta of the ether, which acts on the given proton from the side of other proton is smaller than from all other sides, as is shown in Fig. 2. The difference between the strength of momenta of the ether, acting on the given proton from the side of other proton, and the strength of momenta of the ether, acting on the given proton from the opposite side, represents the strength of the ethereal field acting on the given proton.

The action of the ethereal field on a proton is expressed, that the ethermats, passing through the proton, pushes the mats of the proton mainly in a direction of the motion of the ethermats. And since in the direction of the ethereal field is acted a greater strength of momenta of ether, than in the opposite direction, then the given proton is moved in a direction of the field, i.e. in the direction to other proton, which formed this field. Motion of protons to each other under action on each proton an ethereal field of other proton presents itself an attraction of these protons to each other.

Fig. 3 shows two atoms of hydrogen forming a molecule, where orbital electron of one atom passes through a rarefied sphere of a proton of other atom.

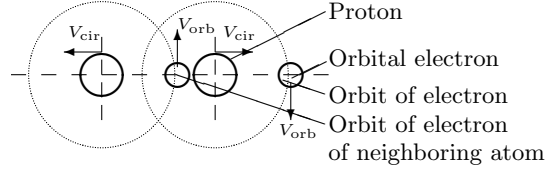


Figure 3: Molecule of hydrogen

Approach of protons, due to their attraction to each other, occurs until tangential collision of orbital electron of one atom with a proton (nucleus) of other atom. At the tangential collision, the orbital electron of one atom passes through a rarefied sphere of a proton of another atom, due to that the electron in a small measure decelerated its velocity and trajectory of orbital motion, but because of free acceleration these parameters are restored. At these tangential collisions the electron insignificantly pushes away the proton, i.e. occurs a increasing of distance between the nucleuses (protons). As the nucleuses of a molecule are constantly attract to each other and at the tangential collisions the orbital electrons of both atoms push away the nucleuses from each other, then the nucleuses have only some fluctuation, at which the internuclear distance changes insignificantly.

4 Instability of Orbital Motion of Electron in Atom of Deuterium

In atom of deuterium (an isotope of atom of hydrogen) the nucleus consists of two nucleons (a proton and a neutron) which attract to each other with overlapping of their rarefied spheres. Fig. 4 shows an atom of deuterium.

The neutron and the proton of the nucleus rotate in opposite directions, due to that the direction of circumferential motion of mats in a place of contact of the nucleons coincides. The basis of nucleons is dense, because it consists of longmats, but the rarefied sphere of nucleons at more removal from the center of the nucleon, have a more rarefaction, because the sphere in this place in a greater measure consists of ovalmats, which have a more mobility than longmats.

Nucleons, besides the separate rotation, have also a general rotation. Orbital electron is on a line, which pass through a proton and neutron, due

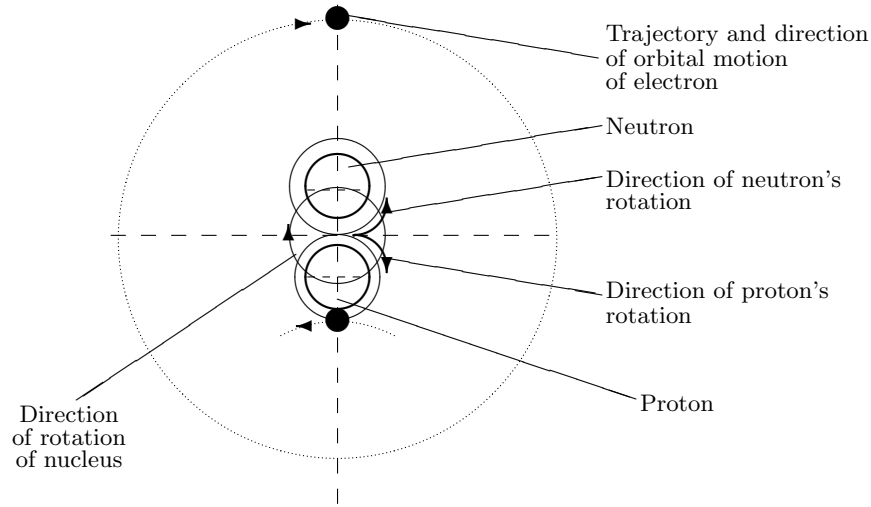


Figure 4: Atom of deuterium

to that that there the ethereal field has the greatest strength. Therefore the rotation of the nucleus and the orbital motion of electron is synchronous. The orbital electron is constantly above the proton, because of an attraction to him. Because of synchronous motion of the proton with the orbital electron around of the center of atom, the orbital electron of one atom has tangential collisions with the proton of other atom of molecule, but with a neutron does not collide. Therefore the neutron has a full rarefied sphere, but the proton has a small rarefied sphere due to the collisions.

Since the neutrons unlike protons have a full rarefied sphere, then the ethermats can not pass through a neutron and the ethermats only slide on rarefied sphere of the neutron. Therefore the average velocity of motion of ethermats, after collisions with the neutron, does not change, and accordingly the neutron do not form such ethereal field as protons. The ethereal field of neutrons has very small range, commensurable with dimensions of a neutron. Therefore the electrons do not form an orbital motion around of separate neutron and consequently the neutron in atom of deuterium does not attract to itself the orbital electron. But after a while at the neutron, because of friction with the proton in structure of the nucleus, the rarefied sphere is decreasing, and due to that the neutron increase its ethereal field and attract also the orbital electron as the proton. In this case can be a central collision of the orbital electron with the proton of the next atom of

molecule, due to that the proton comes off from the neutron, and the orbital electron continues the orbital motion around of the proton, i.e. the atom of deuterium becomes atom of hydrogen.

Tritium, which is a isotope of hydrogen, has a nucleus consisting of one proton and two neutrons. The atom with such nucleus is even less stable.

Conclusion

1. The essence of an attraction of orbital electrons to a nucleus of an atom it, what the ethermats of the nuclear field from all sides around nucleus have a motion in direction to the nucleus, and since in this field there are the electrons, then the ethermats passes through these electrons and pushes them to the nucleus.

2. Free motion of electrons has a free acceleration, otherwise because of ethereal deceleration and of field acceleration of electrons to the nucleus, there could not be an orbital motion of electrons, as they would decelerate the velocity of motion and would decrease the radius of their orbit, and consequently would be attracted to the nucleus.

3. The attraction of protons (nucleuses) to each other in a molecule of hydrogen occurs due to that that the ethermats at passage through the protons decelerate the velocity of the motion. Due to that the strength of momenta of the ether, acting on the protons between these protons, is less than the strength of momenta of the ether, acting on the protons from the opposite sides.

4. Internuclear distance between protons of a molecule of hydrogen is formed because of that the orbital electron of one atom collides with the proton of other atom and pushes away him, not allowing to approach of protons.

5. Orbital electrons can be attracted to one proton, but to one neutron can not be attracted. Isotope of hydrogen, nucleus of which consists of one proton and of one or two neutrons, are unstable, because the neutron at attracting to the proton, became a proton, and therefore is increasing the strength of attraction of the orbital electron to the nucleus, and the orbital electron descends from the orbit.