# A Latent Quantized Force of an Atomic Unification

**Rasulkhozha S. Sharafiddinov**

**Institute of Nuclear Physics, Uzbekistan Academy of Sciences,
Tashkent, 100214 Ulugbek, Uzbekistan**

**Abstract**

At the availability of a force of an atomic unification, a sharp interconnection of the evrmionic antineutrino and neutron must constitute the antineutrino hydrogen of Al-Fargoniy is one of the two atoms having a crucial value for construction of all the remaining ones. We discuss a theory in which atomic orbit quantization is carried out around the nucleus in the flavor type dependence. Such an orbit quantized succession principle splits in external fields the spectral lines of atoms, confirming the availability in them of the family structure. Thereby, it predicts the existence in nature of 63189 forms of isotopes of 118 types of atomic systems. We derive the united equations, which relate in atoms the radii of boson, lepton and antineutrino orbits including the speeds, energies and rotation periods of their particles. Finding for them estimates express, in the case of each of the five forms of uraniums and two types of hydrogens, the ideas of an intraatomic force quantized by leptonic families. They unite all necessary for steadiness and completeness of an atom connections in a unified whole as a role of gravity in an atomic construction. Therefore, any of the structural particles suffers in it a strong change both in lifetime and in his self radius in the orbit type dependence.

## 1. Introduction

A classical planetary model of an atom suggested by Rutherford [1] may be based logically on the absence in nature of a place for absolutely straight line motion. Such a nonclassical connection responsible for periodical rotation of electrons around the nucleus appears in atom as one of highly important consequences of a mass-charge duality [2] principle.

In its framework, each of the electric ($E$), weak ($W$), strong ($S$) and other innate types of charges testifies in favor of the availability of a kind of inertial mass. These masses and charges of an elementary object ($s$) constitute at a grand unification of forces [3] the united rest mass $m_s^U$ and charge $e_s^U$ including all its mass and charge

$$m_s = m_s^U = m_s^E + m_s^W + m_s^S + ..., \tag{1}$$

$$e_s = e_s^U = e_s^E + e_s^W + e_s^S + .... \tag{2}$$

They reflect the coexistence of a force of gravity of the Newton $F_{N_{ss}}$ between the two particles and a force of the Coulomb $F_{C_{ss}}$ among these objects, which may be expressed from the point of view of any of the existing types ($K = E$, $W$, $S$, ...) of actions

$$F_{N_{ss}}^K = G_N \left(\frac{m_s^K}{r}\right)^2, \quad F_{C_{ss}}^K = \frac{1}{4\pi\epsilon_0}\left(\frac{e_s^K}{r}\right)^2, \tag{3}$$

$$F_{N_{ss}}^{ij} = G_N \frac{m_s^i m_s^j}{r^2}, \quad F_{C_{ss}}^{ij} = \frac{1}{4\pi\epsilon_0}\frac{e_s^i e_s^j}{r^2}, \tag{4}$$

where $i$, $j = K$, $i \neq j$, $r$ denotes the distance between objects, and $G_N$ is a constant of gravity.

This in turn implies [3] that each of the electric $F_{ss}^E$, weak $F_{ss}^W$, strong $F_{ss}^S$ and other possible types of forces includes not only a kind of Coulomb $F_{C_{ss}}^K$ but also a kind of Newton $F_{N_{ss}}^K$ parts

$$F_{ss}^K = F_{N_{ss}}^K + F_{C_{ss}}^K, \tag{5}$$

$$F_{ss}^{ij} = F_{N_{ss}}^{ij} + F_{C_{ss}}^{ij}. \tag{6}$$

As a consequence, at the interratio of the structural components, a unified field of action of the united force $F_{ss}^U$ equal to

$$F_{ss}^U = F_{ss}^E + F_{ss}^W + F_{ss}^S + ..., \tag{7}$$

becomes naturally warping [3] one. Therefore, a motion of electrons in an atomic system is strictly an orbital. In them herewith orbitally appear some latent connections. Their nature defines at the quantum mechanical level the behavior of intraatomic objects of all types.

However, as stated in classical electrodynamics, in the same orbit as it moves, neither of electrons rotated around the nucleus cannot remain comparatively for a long time without loss of his energy. At the same time, nature itself unites all parts of ordinary matter in a unified whole. It relates herewith each electron with a nucleus, confirming the availability in it of a stable atomic system.

In an atomic model based on the Bohr [4] postulates, it has usually been assumed that in atom there exist the stationary orbits quantized by angular momenta

$$mv_n r_n = n\hbar, \quad n = 1, 2, 3, ..., \tag{8}$$

and the transitions of an orbital electron from the upper (lower) level to the lower (upper) one originate in it by the photon emission (absorption) laws with an energy coming forward as the difference of energy levels.

For definition of the speed $v$ of electron and of the radius $r$ of its orbit in atom, the second the most important equation is, in the Bohr suggestion, an equality

$$\frac{mv^2}{r} - \frac{1}{4\pi\epsilon_0}\frac{Ze^2}{r^2} = 0 \tag{9}$$

in which $Z|e|$ is a charge of an atomic nucleus.

When it is united with (8), its solutions relate the structural sizes $v$ and $r$ to $Z$, $\alpha$ and $n$ in the form

$$v = \frac{Z\alpha}{n}c, \quad r = \frac{n^2}{Z\alpha}\frac{\hbar}{mc}. \tag{10}$$

According to these results, intraatomic forces at the large masses have the character of attraction, and their property of a repulsion appears only in the electron small mass dependence. Such an order would seem to say about that an atomic construction is not in line with laws of solar system.

On the other hand, as follows from (8) and (9), a development on their basis of the first-initial planetary model of an atom has no neither a classical nor a quantum character. It expresses of course the Bohr idea about atoms of a hydrogenlike nature and thereby gives an explanation of the most simple matter. For the case when atomic system suffers a spontaneous change in his compound structure, the latter encounters the problem connected with implications of so far unobserved latent regularity of a unified nature of all types of atoms.

Many authors state that at the action of an external electric or magnetic field, atomic orbits suffer at first a strong change in their energy levels and, next, they are splitted into different orbital states observed as the spectral line expansions. If this is so, the Bohr atom model splits in an external field the spectral lines of hydrogen, postulating that the same electron may simultaneously be in the most diverse orbits. But nobody has seen an electron itself in orbit of hydrogen, and the influence of an electric or a magnetic field on its spectrum implies simply that neither of the Stark [5] or the Zeeman [6] experiences has never based on the postulates of any phenomenological theories.

One of the most highlighted features of atomic system is its neutrality, which involves that the steadiness of each orbit is fully compatible with lepton universality [7-10] expressing [11] the ideas not only of charge conservation or quantization but also of flavor symmetry [12,13] laws. As a consequence, any electron says about the presence in atom of a kind of antineutrino. They can therefore constitute in orbit the left (right)-handed electronic bosons, each of which unites the left (right)-handed electron and its right (left)-handed antineutrino.

Their presence in turn has a crucial value for the establishment in nature of a true picture of spectral lines of any of the corresponding types of atoms and thereby describes a situation when around each of electrons moved around the nucleus rotates in his orbit its own antineutrino.

Another important consequence implied from a mass-charge duality principle is that the crossing of spectra of electric and weak types of elementary particle masses corresponds in nature to the existence of the lightest lepton and its neutrino. They admit herewith the flavor symmetrical decays of an electron [14], which have not been known before the creation of the first-initial planetary model of an atom.

These facts indicate that between an atomic system and an old theory of its nature there exists a range of the structural contradictions, which require in principle one to go away from the earlier presentations about the atoms using their existence, birth and interconversion as a unity of symmetry laws.

Therefore, our purpose in a given work is to raise the question of a truly quantum mechanical nature of an atom, namely, of a mass-charge structure of an atom having the logically consistent mathematical formulation and allowing to follow the logic of atomic system including the dynamical origination of its spontaneous structural change. This new theory of an atom of orbits quantized by leptonic families establishes a true picture of all types of atoms and a role in their formation of mass, charge and thereby uncovered so far unknown most diverse properties of an atomic unification.

## 2. Mass criterion for atomic unification

A mass-charge duality [2] principle comes forward in atom as a criterion for unification of its structural particles at a latent quantum level that lepton universality implies [11] a constancy of the size

$$m_s^E m_s^W = const \tag{11}$$

corresponding in nature to a coincidence of electric and weak components of mass of the same lightest lepton [14]. Such a lepton ($s = l$), according to the relationship

$$(m_\epsilon^K)^2 = m_\epsilon^E m_\epsilon^W = m_l^E m_l^W = const, \tag{12}$$

may be an evrmion ($\epsilon$) possessing the electric mass and charge

$$m_\epsilon^K = 162.22857 \text{ eV}, \tag{13}$$

$$e_\epsilon^E = 1.602 \cdot 10^{-19} \text{ C} \tag{14}$$

are the fundamental physical parameters

$$m_0^E = m_\epsilon^E, \quad e_0^E = e_\epsilon^E. \tag{15}$$

These implications of lepton universality refer to any particle with an evrmion charge. If one of them is well known proton ($p$), there exists [14] a relation between the masses

$$(m_\epsilon^K)^2 = m_l^E m_l^W = m_p^E m_p^W. \tag{16}$$

The mass of each particle unites in addition all conservation laws in a unified whole. Thereby, it says about a situation [14] when an evrmion has his own neutrino.

To this conclusion one can also lead by another way starting from a mass-charge duality [2], according to which, neutrino universality [15] expresses a constancy of the multiplier

$$m_{\nu_l}^E m_{\nu_l}^W = const, \tag{17}$$

confirming the identicality of electric and weak types of masses of the same lightest neutrino [14]. Such a neutrino, as stated in

$$(m_{\nu_\epsilon}^K)^2 = m_{\nu_\epsilon}^E m_{\nu_\epsilon}^W = m_{\nu_l}^E m_{\nu_l}^W = const, \tag{18}$$

corresponds in the spectra of masses to an evrmion. Charge [16] and mass of the evrmionic neutrino

$$m_{\nu_\epsilon}^K < 7.2550823 \cdot 10^{-5} \text{ eV}, \tag{19}$$

$$e_{\nu_l}^E < 2 \cdot 10^{-13} \text{ e}_0^{\text{E}} \tag{20}$$

refer herewith to fundamental constants characteristic only for those particles in which mass and charge are not comparable with the evrmion mass and charge.

One such an object may, as was noted in [12] for the first time, be a neutron. But unlike the earlier presentations about unification of elementary objects, their classification with respect to C-operation allows to establish one more highly important identity

$$(m_{\nu_\epsilon}^K)^2 = m_{\nu_l}^E m_{\nu_l}^W = m_n^E m_n^W \tag{21}$$

indicating to the equality [17] of the neutron ($n$) and neutrino charges

$$e_{n_{L,R}^-} = e_{\nu_\epsilon L,R}, \quad e_{n_{R,L}^+} = e_{\bar{\nu}_\epsilon R,L}. \tag{22}$$

Thus, the mass requires one at a given stage to characterize any particle by the four ($l = \epsilon$, $e$, $\mu$, $\tau, ...$) lepton flavors

$$L_l = \begin{cases} +1 & \text{for} \quad l_L^-, \quad l_R^-, \quad \nu_{lL}, \quad \nu_{lR}, \\ -1 & \text{for} \quad l_R^+, \quad l_L^+, \quad \bar{\nu}_{lR}, \quad \bar{\nu}_{lL}, \\ \ \ 0 & \text{for} \quad \text{remaining particles.} \end{cases} \tag{23}$$

The presence of only the electron ($e^-$) in corresponding to it orbit ($O_e$) is, as has been mentioned above, incompatible with conservation of the full lepton number

$$L_\epsilon + L_e + L_\mu + L_\tau = const \tag{24}$$

and of all forms of lepton flavors

$$L_l = const \tag{25}$$

responsible for the formation [18] in it of an electronic string from the four types of the left- or right-handed flavor symmetrical leptonic strings

$$(l^-_L, \bar{\nu}_{lR}), \quad (l^-_R, \bar{\nu}_{lL}). \tag{26}$$

Therefore, from the point of view of a unity of atomic systems and symmetry laws, each of (16) and (21) must be interpreted as an indication to the existence in atom of the left- and right-handed flavor symmetrical ($L_l = const$) boson and flavor antisymmetrical ($L_l \neq const$) lepton and antineutrino orbits quantized by leptonic families. In other words, the nature of atomic system has been created so that to any type of lepton flavor corresponds a kind of left (right)-handed orbit.

However, as we have seen, an evrmionic family has the extremely lower electric mass and that, consequently, the left- and right-handed evrmionic strings of

$$(\epsilon^-_L, \bar{\nu}_{\epsilon R}), \quad (\epsilon^-_R, \bar{\nu}_{\epsilon L}) \tag{27}$$

move around the nucleus in the first left-handed ($O^L_{\epsilon\bar{\nu}_\epsilon}$) and the second right-handed ($O^R_{\epsilon\bar{\nu}_\epsilon}$) orbits.

The third left-handed ($O^L_{e\bar{\nu}_e}$) and fourth right-handed ($O^R_{e\bar{\nu}_e}$) orbits in atom refer, respectively, to left- and right-handed structural states of electronic bosons

$$(e^-_L, \bar{\nu}_{eR}), \quad (e^-_R, \bar{\nu}_{eL}). \tag{28}$$

The muons and their antineutrinos forming the left- and right-handed muonic strings

$$(\mu^-_L, \bar{\nu}_{\mu R}), \quad (\mu^-_R, \bar{\nu}_{\mu L}) \tag{29}$$

are of the fifth left-handed ($O^L_{\mu\bar{\nu}_\mu}$) and sixth right-handed ($O^R_{\mu\bar{\nu}_\mu}$) orbits of an atom.

Among the best known families of leptons only the $\tau$-leptons possess the large electric mass and therefore the seventh left-handed ($O^L_{\tau\bar{\nu}_\tau}$) and eighth right-handed ($O^R_{\tau\bar{\nu}_\tau}$) orbits correspond in atom to $\tau$-leptons and their antineutrinos, namely, to left- and right-handed tauonic bosons

$$(\tau^-_L, \bar{\nu}_{\tau R}), \quad (\tau^-_R, \bar{\nu}_{\tau L}). \tag{30}$$

It is already clear from the foregoing that the string orbits

$$O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \tag{31}$$

satisfying the inequalities

$$m^E_\epsilon < m^E_e < m^E_\mu < m^E_p < m^E_\tau, \tag{32}$$

$$m^E_{\nu_\epsilon} < m^E_{\nu_e} < m^E_{\nu_\mu} < m^E_{\nu_\tau} < m^E_n \tag{33}$$

appear in the mass dependence of leptonic bosons.

But an order such as (31) exists only for those atoms in which a nucleus consists of nucleons with an equal ($Z = N$) number of protons and neutrons. Therefore, to include in the discussion the atomic systems with an unequal ($Z \neq N$) number of neutrons ($N$) and protons ($Z$), we must at first recall the baryon number [19] conservation law stating that the nucleons (antinucleons) have the positive (negative) unity $[+1(-1)]$ baryon ($B$) charge. Then it is possible, for example, the neutrons ($n^-_{L,R}$) and antiprotons ($p^+_{R,L}$) constitute at $N = Z$ the left- and right-handed hadronic strings

$$(n^-_L, p^+_R), \quad (n^-_R, p^+_L) \tag{34}$$

responsible for the bosonic structure of spinless nuclei without isospin as well as for their baryon symmetrical ($B = const$) picture.

Simultaneously, as is now well known, between the atomic system and the nuclear matter there exists a range of innate symmetries, the unity of which expresses, in the case of all types of atoms, the idea of the same unified principle about that

$$L_l + B = const. \tag{35}$$

This united regularity in turn gives the right to apply to the case when $Z > N$. At such a choice of an atomic nucleus, around it rotates in the first left-handed ($O_{\epsilon}^{L}$) and the second right-handed ($O_{\epsilon}^{R}$) orbits the left- and right-handed evrmions. To electrons of the left- and right-handed components correspond the third left-handed ($O_{e}^{L}$) and fourth right-handed ($O_{e}^{R}$) orbits. The fifth left-handed ($O_{\mu}^{L}$) and sixth right-handed ($O_{\mu}^{R}$) orbits of these types of atoms refer doubtless to left- and right-handed muons. Their seventh left-handed ($O_{\tau}^{L}$) and eighth right-handed ($O_{\tau}^{R}$) orbits remain only for the left- and right-handed $\tau$-leptons.

It is clear, however, that the lepton orbits

$$O_{\epsilon}^{L}, \quad O_{\epsilon}^{R}, \quad O_{e}^{L}, \quad O_{e}^{R}, \quad O_{\mu}^{L}, \quad O_{\mu}^{R}, \quad O_{\tau}^{L}, \quad O_{\tau}^{R} \tag{36}$$

appear in atom as the difference of masses (13) and

$$m_{e}^{E} = 0.51 \text{ MeV}, \quad m_{\mu}^{E} = 105.658 \text{ MeV}, \quad m_{\tau}^{E} = 1776.99 \text{ MeV}, \tag{37}$$

$$m_{e}^{W} = 5.15 \cdot 10^{-2} \text{ eV}, \quad m_{\mu}^{W} = 2.49 \cdot 10^{-4} \text{ eV}, \quad m_{\tau}^{W} = 1.48 \cdot 10^{-5} \text{ eV} \tag{38}$$

implied from the laboratory facts [14,20].

If choose a neutron number $N > Z$, at which an atomic system construction is not quite in line with ideas of (35), then for the case of neutrino universality when it leads us to (22), summed charge is

$$e_{n^{-}} + e_{\bar{\nu}_{\epsilon}} = 0, \tag{39}$$

because of which an atom itself requires the rotation around its nucleus in the first left-handed ($O_{\bar{\nu}_{\epsilon}}^{L}$) and the second right-handed ($O_{\bar{\nu}_{\epsilon}}^{R}$) orbits of the right- and left-handed evrmionic antineutrinos. Electronic antineutrinos of the right- and left–handed components are of the third left-handed ($O_{\bar{\nu}_{e}}^{L}$) and fourth right-handed ($O_{\bar{\nu}_{e}}^{R}$) orbits of the discussed types of atoms. In them the fifth left-handed ($O_{\bar{\nu}_{\mu}}^{L}$) and sixth right-handed ($O_{\bar{\nu}_{\mu}}^{R}$) orbits correspond to right- and left-handed muonic antineutrinos. Insofar as the right- and left-handed tauonic antineutrinos are concerned, they move around the nucleus in the seventh left-handed ($O_{\bar{\nu}_{\tau}}^{L}$) and the eighth right-handed ($O_{\bar{\nu}_{\tau}}^{R}$) orbits. Formulating more concretely, one can present the antineutrino orbits in the framework [14,20] of the spectrum of masses (19) and

$$m_{\nu_{e}}^{E} < 2.5 \text{ eV}, \quad m_{\nu_{\mu}}^{E} < 0.17 \text{ MeV}, \quad m_{\nu_{\tau}}^{E} < 18.2 \text{ MeV} \tag{40}$$

$$m_{\nu_{e}}^{W} < 2.1 \cdot 10^{-9} \text{ eV}, \quad m_{\nu_{\mu}}^{W} < 3.096 \cdot 10^{-14} \text{ eV}, \quad m_{\nu_{\tau}}^{W} < 2.89 \cdot 10^{-16} \text{ eV}, \tag{41}$$

by the following manner:

$$O_{\bar{\nu}_{\epsilon}}^{L}, \quad O_{\bar{\nu}_{\epsilon}}^{R}, \quad O_{\bar{\nu}_{e}}^{L}, \quad O_{\bar{\nu}_{e}}^{R}, \quad O_{\bar{\nu}_{\mu}}^{L}, \quad O_{\bar{\nu}_{\mu}}^{R}, \quad O_{\bar{\nu}_{\tau}}^{L}, \quad O_{\bar{\nu}_{\tau}}^{R}. \tag{42}$$

All three forms of orbits (31), (36) and (42) exist in those molecules, which consist of atoms not possessing the same orbits. But their order depends on masses [14,20] of both fermions of leptonic families and structural particles of atomic nuclei

$$m_{p}^{E} = 938.272 \text{ MeV}, \quad m_{n}^{E} = 939.565 \text{ MeV}, \tag{43}$$

$$m_p^W = 2.8049 \cdot 10^{-5} \text{ eV}, \quad m_n^W = 5.6021 \cdot 10^{-18} \text{ eV}. \tag{44}$$

We observe finally that the suggested atom that explains the orbit quantization of a nucleus in the flavor type dependence and the availability in nature of the quantized succession of leptonic families recognizing the existence in our space-time of the antiprotons, neutrons, leptons and antineutrinos does not exclude that $l^-_{L,R}$, $\bar{\nu}_{lR,L}$, $p^+_{R,L}$ and $n^-_{L,R}$ are of fermions, and $l^+_{R,L}$, $\nu_{lL,R}$, $p^-_{L,R}$ and $n^+_{R,L}$ refer to antifermions.

## 3. Boson, lepton and antineutrino orbits of an atom

The preceding reasoning says that nature itself constitutes the atomic systems so that to the case of spinless nuclei without isospin corresponds a kind of orbital order. A beautiful example is an order of orbits of the following atoms:

$$He^4_2 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$Li^6_3 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O_{e\bar{\nu}_e} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,$$

$$B^{10}_5 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O_{\mu\bar{\nu}_\mu} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,$$

$$C^{12}_6 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5,6 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,1,$$

$$N^{14}_7 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$O^{16}_8 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1,$$
$$N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$F^{18}_9 \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Ne^{20}_{10} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 1,1,$$
$$N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$Na^{22}_{11} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$

$$N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 2,2, \quad N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Mg^{24}_{12} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 2,2,$$
$$N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$Al^{26}_{13} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 2,2, \quad N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Si^{28}_{14} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 2,2, \quad N_{e\bar{\nu}_e} = 2,2,$$
$$N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$P^{30}_{15} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2, \quad N^o_{e\bar{\nu}_e} = 3,4,$$
$$N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 3,3, \quad N_{e\bar{\nu}_e} = 2,2, \quad N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$S^{32}_{16} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 3,3, \quad N_{e\bar{\nu}_e} = 2,2,$$
$$N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$Ca^{40}_{20} \rightarrow O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\epsilon\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{e\bar{\nu}_e} = 3,4, \quad N^o_{\mu\bar{\nu}_\mu} = 5,6, \quad N^o_{\tau\bar{\nu}_\tau} = 7,8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 4,4, \quad N_{e\bar{\nu}_e} = 3,3,$$
$$N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,1.$$

The size of $N^o_{l\bar{\nu}_l}$ describes here the order of boson orbits, $N_{l\bar{\nu}_l}$ characterizes in each of them the quantity of leptonic bosons.

Furthermore, if it turns out that $N_{l\bar{\nu}_l} = 1$ at $N^o_{l\bar{\nu}_l} = 3,5,7$, a spin state of internal parts of a single leptonic boson in any of these final boson orbits $O_{l\bar{\nu}_l}$ depends on whether nucleons of the latter hadronic string in an atomic nucleus refer to left- or right-handed fermions.

Another characteristic moment is an equal number of particles of the left- and right-handed atomic orbits of the same leptonic family. Such a correspondence expresses the dynamical origination in atom of spontaneous mirror symmetry violation as well as the unidenticality [21] of masses, energies and momenta of its left- and right-handed objects.

But for atoms, in a nucleus of which $Z > N$, boson orbits are not the only ones. They have more of lepton orbits. An example of this may be each unstable isotope of

$$He^3_2 \rightarrow O_\epsilon, \quad O_{\epsilon\bar{\nu}_\epsilon} \rightarrow N^o_\epsilon = 1, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 2 \rightarrow N_\epsilon = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$C^9_6 \rightarrow O^L_\epsilon, \quad O^R_\epsilon, \quad O_e, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O_{e\bar{\nu}_e} \rightarrow N^o_\epsilon = 1,2, \quad N^o_e = 3,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 4,5, \quad N^o_{e\bar{\nu}_e} = 6 \rightarrow N_\epsilon = 1,1, \quad N_e = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,$$

$$F_9^{17} \rightarrow O_\epsilon, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_\epsilon = 1,$$

$$N^o_{\epsilon\bar{\nu}_\epsilon} = 2,3, \quad N^o_{e\bar{\nu}_e} = 4,5, \quad N^o_{\mu\bar{\nu}_\mu} = 6,7, \quad N^o_{\tau\bar{\nu}_\tau} = 8,9 \rightarrow N_\epsilon = 1,$$

$$N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$Ne_{10}^{17} \rightarrow O^L_\epsilon, \quad O^R_\epsilon, \quad O_e, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_\epsilon = 1,2,$$

$$N^o_e = 3, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 4,5, \quad N^o_{e\bar{\nu}_e} = 6,7, \quad N^o_{\mu\bar{\nu}_\mu} = 8,9, \quad N^o_{\tau\bar{\nu}_\tau} = 10 \rightarrow N_\epsilon = 1,1,$$

$$N_e = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1, \quad N_{\mu\bar{\nu}_\mu} = 1,1, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

where $N_l^o$ implies the order of lepton orbits, $N_l$ denotes the quantity of their leptons.

An atom itself chooses herewith the spin state of a single particle of his lepton orbit $O_l$ so that to the left- or right-handed lepton corresponds in its nucleus a kind of polarized antiproton.

There are many other atoms in which must appear the antineutrino orbits, since the number of antiprotons and neutrons in their nuclei satisfies the inequality $N > Z$ violating in an atomic system summed baryon and lepton number conservation. For example, in atoms such as

$$Be_4^9 \rightarrow O_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 2,3,$$

$$N^o_{e\bar{\nu}_e} = 4,5 \rightarrow N_{\bar{\nu}_\epsilon} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1, \quad N_{e\bar{\nu}_e} = 1,1,$$

$$Cl_{17}^{35} \rightarrow O_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,$$

$$N^o_{\epsilon\bar{\nu}_\epsilon} = 2,3, \quad N^o_{e\bar{\nu}_e} = 4,5, \quad N^o_{\mu\bar{\nu}_\mu} = 6,7, \quad N^o_{\tau\bar{\nu}_\tau} = 8 \rightarrow N_{\bar{\nu}_\epsilon} = 1,$$

$$N_{\epsilon\bar{\nu}_\epsilon} = 3,3, \quad N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Ar_{18}^{40} \rightarrow O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$

$$O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 5,6, \quad N^o_{e\bar{\nu}_e} = 7,8,$$

$$N^o_{\mu\bar{\nu}_\mu} = 9,10, \quad N^o_{\tau\bar{\nu}_\tau} = 11,12 \rightarrow N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1,$$

$$N_{\epsilon\bar{\nu}_\epsilon} = 3,3, \quad N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 1,1,$$

$$K_{19}^{39} \rightarrow O_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,$$

$$N^o_{\epsilon\bar{\nu}_\epsilon} = 2,3, \quad N^o_{e\bar{\nu}_e} = 4,5, \quad N^o_{\mu\bar{\nu}_\mu} = 6,7, \quad N^o_{\tau\bar{\nu}_\tau} = 8 \rightarrow N_{\bar{\nu}_\epsilon} = 1,$$

$$N_{\epsilon\bar{\nu}_\epsilon} = 3,3, \quad N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Sc_{21}^{45} \rightarrow O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,$$

$$N^o_{\bar{\nu}_e} = 3, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 4,5, \quad N^o_{e\bar{\nu}_e} = 6,7, \quad N^o_{\mu\bar{\nu}_\mu} = 8,9, \quad N^o_{\tau\bar{\nu}_\tau} = 10,11 \rightarrow N_{\bar{\nu}_\epsilon} = 1,1,$$

$$N_{\bar{\nu}_e} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 4,4, \quad N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Ti_{22}^{48} \rightarrow O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$

$$O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 5,6, \quad N^o_{e\bar{\nu}_e} = 7,8,$$

$$N^o_{\mu\bar{\nu}_\mu} = 9,10, \quad N^o_{\tau\bar{\nu}_\tau} = 11,12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 4,4,$$
$$N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 2,2, \quad N_{\tau\bar{\nu}_\tau} = 2,2,$$

$$V^{51}_{23} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$
$$O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7, \quad N^o_{e\bar{\nu}_e} = 8,9,$$
$$N^o_{\mu\bar{\nu}_\mu} = 10,11, \quad N^o_{\tau\bar{\nu}_\tau} = 12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 4,4, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Cr^{52}_{24} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau},$$
$$O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 5,6, \quad N^o_{e\bar{\nu}_e} = 7,8,$$
$$N^o_{\mu\bar{\nu}_\mu} = 9,10, \quad N^o_{\tau\bar{\nu}_\tau} = 11,12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 4,4,$$
$$N_{e\bar{\nu}_e} = 3,3, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 2,2,$$

$$Mn^{55}_{25} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$
$$O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7, \quad N^o_{e\bar{\nu}_e} = 8,9,$$
$$N^o_{\mu\bar{\nu}_\mu} = 10,11, \quad N^o_{\tau\bar{\nu}_\tau} = 12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Fe^{56}_{26} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau},$$
$$O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 5,6, \quad N^o_{e\bar{\nu}_e} = 7,8,$$
$$N^o_{\mu\bar{\nu}_\mu} = 9,10, \quad N^o_{\tau\bar{\nu}_\tau} = 11,12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 4,4, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 2,2,$$

$$Co^{59}_{27} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$
$$O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7, \quad N^o_{e\bar{\nu}_e} = 7,8,$$
$$N^o_{\mu\bar{\nu}_\mu} = 9,10, \quad N^o_{\tau\bar{\nu}_\tau} = 11 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Ni^{58}_{28} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau},$$
$$O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 3,4, \quad N^o_{e\bar{\nu}_e} = 5,6, \quad N^o_{\mu\bar{\nu}_\mu} = 7,8,$$
$$N^o_{\tau\bar{\nu}_\tau} = 9,10 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 2,2,$$

$$Cu^{63}_{29} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$
$$O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7, \quad N^o_{e\bar{\nu}_e} = 8,9,$$
$$N^o_{\mu\bar{\nu}_\mu} = 10,11, \quad N^o_{\tau\bar{\nu}_\tau} = 12 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,$$

$$N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Zn^{65}_{30} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu},$$

$$O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7, \quad N^o_{e\bar{\nu}_e} = 8,9,$$
$$N^o_{\mu\bar{\nu}_\mu} = 10,11, \quad N^o_{\tau\bar{\nu}_\tau} = 12,13 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 3,3, \quad N_{\tau\bar{\nu}_\tau} = 3,3,$$

$$Ga^{69}_{31} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Ge^{72}_{32} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\bar{\nu}_\tau}, \quad O^R_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6 \quad N^o_{\bar{\nu}_\tau} = 7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10, \quad N^o_{e\bar{\nu}_e} = 11,12, \quad N^o_{\mu\bar{\nu}_\mu} = 13,14, \quad N^o_{\tau\bar{\nu}_\tau} = 15,16 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1,$$
$$N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 4,4, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 3,3,$$

$$As^{75}_{33} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 6,6, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Se^{79}_{34} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14,15 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 5,5, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 3,3,$$

$$Br^{80}_{35} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 7,8, \quad N^o_{e\bar{\nu}_e} = 9,10,$$
$$N^o_{\mu\bar{\nu}_\mu} = 11,12, \quad N^o_{\tau\bar{\nu}_\tau} = 13 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\epsilon\bar{\nu}_\epsilon} = 7,7, \quad N_{e\bar{\nu}_e} = 6,6, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Kr^{84}_{36} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\bar{\nu}_\tau}, \quad O^R_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7,8,$$

$$N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10, \quad N^o_{e\bar{\nu}_e} = 11,12, \quad N^o_{\mu\bar{\nu}_\mu} = 13,14, \quad N^o_{\tau\bar{\nu}_\tau} = 15,16 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2,$$
$$N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 3,3,$$

$$Rb^{85}_{37} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 7,7, \quad N_{e\bar{\nu}_e} = 7,7, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Sr^{87}_{38} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14,15 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 4,4,$$

$$Y^{89}_{39} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 8,8, \quad N_{e\bar{\nu}_e} = 7,7, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Zr^{91}_{40} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14,15 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 5,5, \quad N_{\tau\bar{\nu}_\tau} = 4,4,$$

$$Nb^{93}_{41} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11, \quad N^o_{\mu\bar{\nu}_\mu} = 12,13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2, \quad N_{\bar{\nu}_\mu} = 1,1,$$
$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 8,8, \quad N_{e\bar{\nu}_e} = 8,8, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Mo^{96}_{42} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\bar{\nu}_\tau}, \quad O^R_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O^L_{\tau\bar{\nu}_\tau}, \quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4 \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10, \quad N^o_{e\bar{\nu}_e} = 11,12, \quad N^o_{\mu\bar{\nu}_\mu} = 13,14, \quad N^o_{\tau\bar{\nu}_\tau} = 15,16 \to N_{\bar{\nu}_\epsilon} = 2,2, \quad N_{\bar{\nu}_e} = 2,2,$$
$$N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6, \quad N_{e\bar{\nu}_e} = 6,6, \quad N_{\mu\bar{\nu}_\mu} = 5,5, \quad N_{\tau\bar{\nu}_\tau} = 4,4,$$

$$Tc^{97}_{43} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e}, \quad O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=2,2,\quad N_{\bar{\nu}_e}=2,2,\quad N_{\bar{\nu}_\mu}=1,1,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=9,9,\quad N_{e\bar{\nu}_e}=8,8,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Ru^{102}_{44} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=2,2,\quad N_{\bar{\nu}_e}=2,2,$$
$$N_{\bar{\nu}_\mu}=2,2,\quad N_{\bar{\nu}_\tau}=1,1,\quad N_{\epsilon\bar{\nu}_\epsilon}=7,7,\quad N_{e\bar{\nu}_e}=6,6,\quad N_{\mu\bar{\nu}_\mu}=5,5,\quad N_{\tau\bar{\nu}_\tau}=4,4,$$

$$Rh^{103}_{45} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},\quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=2,2,\quad N_{\bar{\nu}_e}=2,2,\quad N_{\bar{\nu}_\mu}=2,2,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=9,9,\quad N_{e\bar{\nu}_e}=9,9,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Pd^{106}_{46} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=2,2,\quad N_{\bar{\nu}_e}=2,2,$$
$$N_{\bar{\nu}_\mu}=2,2,\quad N_{\bar{\nu}_\tau}=1,1,\quad N_{\epsilon\bar{\nu}_\epsilon}=7,7,\quad N_{e\bar{\nu}_e}=6,6,\quad N_{\mu\bar{\nu}_\mu}=5,5,\quad N_{\tau\bar{\nu}_\tau}=5,5,$$

$$Ag^{108}_{47} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,$$
$$N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15 \to N_{\bar{\nu}_\epsilon}=2,2,\quad N_{\bar{\nu}_e}=2,2,\quad N_{\bar{\nu}_\mu}=2,2,$$
$$N_{\bar{\nu}_\tau}=1,1,\quad N_{\epsilon\bar{\nu}_\epsilon}=10,10,\quad N_{e\bar{\nu}_e}=9,9,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Cd^{112}_{48} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=3,3,\quad N_{\bar{\nu}_e}=2,2,$$
$$N_{\bar{\nu}_\mu}=2,2, N_{\bar{\nu}_\tau}=1,1,\quad N_{\epsilon\bar{\nu}_\epsilon}=7,7,\quad N_{e\bar{\nu}_e}=6,6,\quad N_{\mu\bar{\nu}_\mu}=6,6,\quad N_{\tau\bar{\nu}_\tau}=5,5,$$

$$In^{115}_{49} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=3,3,\quad N_{\bar{\nu}_e}=3,3,\quad N_{\bar{\nu}_\mu}=2,2,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=10,10,\quad N_{e\bar{\nu}_e}=10,10,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Sn^{118}_{50} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=3,3,\quad N_{\bar{\nu}_e}=2,2,$$
$$N_{\bar{\nu}_\mu}=2,2,\quad N_{\bar{\nu}_\tau}=2,2,\quad N_{\epsilon\bar{\nu}_\epsilon}=7,7,\quad N_{e\bar{\nu}_e}=7,7,\quad N_{\mu\bar{\nu}_\mu}=6,6,\quad N_{\tau\bar{\nu}_\tau}=5,5,$$

$$Sb^{121}_{51} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=3,3,\quad N_{\bar{\nu}_e}=3,3,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=11,11,\quad N_{e\bar{\nu}_e}=10,10,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Te^{127}_{52} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},\quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14,15 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=8,8,\quad N_{e\bar{\nu}_e}=7,7,\quad N_{\mu\bar{\nu}_\mu}=6,6,\quad N_{\tau\bar{\nu}_\tau}=5,5,$$

$$I^{127}_{53} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=2,2,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=11,11,\quad N_{e\bar{\nu}_e}=11,11,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Xe^{131}_{54} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},\quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14,15 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=8,8,\quad N_{e\bar{\nu}_e}=7,7,\quad N_{\mu\bar{\nu}_\mu}=6,6,\quad N_{\tau\bar{\nu}_\tau}=6,6,$$

$$Cs^{133}_{55} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=12,12,\quad N_{e\bar{\nu}_e}=11,11,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Ba^{137}_{56} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},\quad O^L_{\mu\bar{\nu}_\mu},$$
$$O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14,15 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=4,4,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=8,8,\quad N_{e\bar{\nu}_e}=7,7,\quad N_{\mu\bar{\nu}_\mu}=7,7,\quad N_{\tau\bar{\nu}_\tau}=6,6,$$

$$La^{139}_{57} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=4,4,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=12,12,\quad N_{e\bar{\nu}_e}=12,12,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1.$$

The value of $N^o_{\bar{\nu}_l}$ characterizes the order of antineutrino orbits, $N_{\bar{\nu}_l}$ describes in any of them the quantity of antineutrinos.

A nucleus itself indicates herewith that the helicity of a single antiparticle of its final antineutrino orbit $O_{\bar{\nu}_l}$ depends on what is the spin state of the corresponding to it of his latter neutron.

To express their idea more clearly, one must define an orbital structure of those atoms in which mass $(A = N + Z)$ number has been restricted from below by 140 and above by 175 nucleons with an unequal number of antiprotons and neutrons. Such atomic systems can establish an order of antineutrino orbits by the following manner:

$$Ce^{140}_{58} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=3,3,$$
$$N_{\bar{\nu}_\mu}=3,3,\quad N_{\bar{\nu}_\tau}=2,2,\quad N_{\epsilon\bar{\nu}_\epsilon}=8,8,\quad N_{e\bar{\nu}_e}=8,8,\quad N_{\mu\bar{\nu}_\mu}=7,7,\quad N_{\tau\bar{\nu}_\tau}=6,6,$$

$$Pr^{141}_{59} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=13,13,\quad N_{e\bar{\nu}_e}=12,12,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Nd^{144}_{60} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=3,3,$$
$$N_{\bar{\nu}_\mu}=3,3,\quad N_{\bar{\nu}_\tau}=2,2,\quad N_{\epsilon\bar{\nu}_\epsilon}=9,9,\quad N_{e\bar{\nu}_e}=8,8,\quad N_{\mu\bar{\nu}_\mu}=7,7,\quad N_{\tau\bar{\nu}_\tau}=6,6,$$

$$Pm^{145}_{61} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=4,4,\quad N_{\bar{\nu}_\mu}=3,3,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=13,13,\quad N_{e\bar{\nu}_e}=13,13,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Sm^{150}_{62} \to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16 \to N_{\bar{\nu}_\epsilon}=4,4,\quad N_{\bar{\nu}_e}=3,3,$$
$$N_{\bar{\nu}_\mu}=3,3,\quad N_{\bar{\nu}_\tau}=3,3,\quad N_{\epsilon\bar{\nu}_\epsilon}=9,9,\quad N_{e\bar{\nu}_e}=8,8,\quad N_{\mu\bar{\nu}_\mu}=7,7,\quad N_{\tau\bar{\nu}_\tau}=7,7,$$

$$Eu_{63}^{152} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau}^L,\quad O_{\bar{\nu}_\tau}^R,\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau} \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,8,\quad N_{\epsilon\bar{\nu}_\epsilon}^o = 9,10,$$
$$N_{e\bar{\nu}_e}^o = 11,12,\quad N_{\mu\bar{\nu}_\mu}^o = 13,14,\quad N_{\tau\bar{\nu}_\tau}^o = 15 \rightarrow N_{\bar{\nu}_\epsilon} = 4,4,\quad N_{\bar{\nu}_e} = 4,4,\quad N_{\bar{\nu}_\mu} = 4,4,$$
$$N_{\bar{\nu}_\tau} = 1,1,\quad N_{\epsilon\bar{\nu}_\epsilon} = 14,14,\quad N_{e\bar{\nu}_e} = 13,13,\quad N_{\mu\bar{\nu}_\mu} = 4,4,\quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Gd_{64}^{157} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau},\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau}^L,\quad O_{\tau\bar{\nu}_\tau}^R \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,$$
$$N_{\epsilon\bar{\nu}_\epsilon}^o = 8,9,\quad N_{e\bar{\nu}_e}^o = 10,11,\quad N_{\mu\bar{\nu}_\mu}^o = 12,13,\quad N_{\tau\bar{\nu}_\tau}^o = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 5,5,$$
$$N_{\bar{\nu}_\mu} = 4,4,\quad N_{\bar{\nu}_\tau} = 1,\quad N_{\epsilon\bar{\nu}_\epsilon} = 9,9,\quad N_{e\bar{\nu}_e} = 8,8,\quad N_{\mu\bar{\nu}_\mu} = 8,8,\quad N_{\tau\bar{\nu}_\tau} = 7,7,$$

$$Tb_{65}^{159} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau},\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau} \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,\quad N_{\epsilon\bar{\nu}_\epsilon}^o = 8,9,$$
$$N_{e\bar{\nu}_e}^o = 10,11,\quad N_{\mu\bar{\nu}_\mu}^o = 12,13,\quad N_{\tau\bar{\nu}_\tau}^o = 14 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 5,5,\quad N_{\bar{\nu}_\mu} = 4,4,$$
$$N_{\bar{\nu}_\tau} = 1,\quad N_{\epsilon\bar{\nu}_\epsilon} = 14,14,\quad N_{e\bar{\nu}_e} = 14,14,\quad N_{\mu\bar{\nu}_\mu} = 4,4,\quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Dy_{66}^{162} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau}^L,\quad O_{\bar{\nu}_\tau}^R,\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau}^L,\quad O_{\tau\bar{\nu}_\tau}^R \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,8,$$
$$N_{\epsilon\bar{\nu}_\epsilon}^o = 9,10,\quad N_{e\bar{\nu}_e}^o = 11,12,\quad N_{\mu\bar{\nu}_\mu}^o = 13,14,\quad N_{\tau\bar{\nu}_\tau}^o = 15,16 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 4,4,$$
$$N_{\bar{\nu}_\mu} = 3,3,\quad N_{\bar{\nu}_\tau} = 3,3,\quad N_{\epsilon\bar{\nu}_\epsilon} = 9,9,\quad N_{e\bar{\nu}_e} = 9,9,\quad N_{\mu\bar{\nu}_\mu} = 8,8,\quad N_{\tau\bar{\nu}_\tau} = 7,7,$$

$$Ho_{67}^{165} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau},\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau} \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,\quad N_{\epsilon\bar{\nu}_\epsilon}^o = 8,9,$$
$$N_{e\bar{\nu}_e}^o = 10,11,\quad N_{\mu\bar{\nu}_\mu}^o = 12,13,\quad N_{\tau\bar{\nu}_\tau}^o = 14 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 5,5,\quad N_{\bar{\nu}_\mu} = 5,5,$$
$$N_{\bar{\nu}_\tau} = 1,\quad N_{\epsilon\bar{\nu}_\epsilon} = 15,15,\quad N_{e\bar{\nu}_e} = 14,14,\quad N_{\mu\bar{\nu}_\mu} = 4,4,\quad N_{\tau\bar{\nu}_\tau} = 1,$$

$$Er_{68}^{167} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau},\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau}^L,\quad O_{\tau\bar{\nu}_\tau}^R \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,$$
$$N_{\epsilon\bar{\nu}_\epsilon}^o = 8,9,\quad N_{e\bar{\nu}_e}^o = 10,11,\quad N_{\mu\bar{\nu}_\mu}^o = 12,13,\quad N_{\tau\bar{\nu}_\tau}^o = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 5,5,$$
$$N_{\bar{\nu}_\mu} = 5,5,\quad N_{\bar{\nu}_\tau} = 1,\quad N_{\epsilon\bar{\nu}_\epsilon} = 10,10,\quad N_{e\bar{\nu}_e} = 9,9,\quad N_{\mu\bar{\nu}_\mu} = 8,8,\quad N_{\tau\bar{\nu}_\tau} = 7,7,$$

$$Tu_{69}^{169} \rightarrow O_{\bar{\nu}_\epsilon}^L,\quad O_{\bar{\nu}_\epsilon}^R,\quad O_{\bar{\nu}_e}^L,\quad O_{\bar{\nu}_e}^R,\quad O_{\bar{\nu}_\mu}^L,\quad O_{\bar{\nu}_\mu}^R,\quad O_{\bar{\nu}_\tau},\quad O_{\epsilon\bar{\nu}_\epsilon}^L,\quad O_{\epsilon\bar{\nu}_\epsilon}^R,\quad O_{e\bar{\nu}_e}^L,\quad O_{e\bar{\nu}_e}^R,$$
$$O_{\mu\bar{\nu}_\mu}^L,\quad O_{\mu\bar{\nu}_\mu}^R,\quad O_{\tau\bar{\nu}_\tau} \rightarrow N_{\bar{\nu}_\epsilon}^o = 1,2,\quad N_{\bar{\nu}_e}^o = 3,4\quad N_{\bar{\nu}_\mu}^o = 5,6,\quad N_{\bar{\nu}_\tau}^o = 7,\quad N_{\epsilon\bar{\nu}_\epsilon}^o = 8,9,$$
$$N_{e\bar{\nu}_e}^o = 10,11,\quad N_{\mu\bar{\nu}_\mu}^o = 12,13,\quad N_{\tau\bar{\nu}_\tau}^o = 14 \rightarrow N_{\bar{\nu}_\epsilon} = 5,5,\quad N_{\bar{\nu}_e} = 5,5,\quad N_{\bar{\nu}_\mu} = 5,5,$$

$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=15,15,\quad N_{e\bar{\nu}_e}=15,15,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Yb^{173}_{70}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,\quad N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14,15\to N_{\bar{\nu}_\epsilon}=6,6,\quad N_{\bar{\nu}_e}=5,5,$$
$$N_{\bar{\nu}_\mu}=5,5,\quad N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=10,10,\quad N_{e\bar{\nu}_e}=9,9,\quad N_{\mu\bar{\nu}_\mu}=8,8,\quad N_{\tau\bar{\nu}_\tau}=8,8,$$

$$Lu^{175}_{71}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=6,6,\quad N_{\bar{\nu}_e}=5,5,\quad N_{\bar{\nu}_\mu}=5,5,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=16,16,\quad N_{e\bar{\nu}_e}=15,15,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1.$$

As we see, either boson or antineutrino orbits corresponding in atoms to the muonic and tauonic families at the transition between the atomic systems suffer a strong change in quantity of their objects. This becomes possible owing to an orbit quantized succession principle.

For further uncovering of its feature, it is desirable to present here an orbital structure of atomic systems of mass number from 178 to 227 in an explicit form

$$Hf^{178}_{72}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=5,5,\quad N_{\bar{\nu}_e}=5,5,$$
$$N_{\bar{\nu}_\mu}=4,4,\quad N_{\bar{\nu}_\tau}=3,3,\quad N_{\epsilon\bar{\nu}_\epsilon}=10,10,\quad N_{e\bar{\nu}_e}=9,9,\quad N_{\mu\bar{\nu}_\mu}=9,9,\quad N_{\tau\bar{\nu}_\tau}=8,8,$$

$$Tu^{181}_{73}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=6,6,\quad N_{\bar{\nu}_e}=6,6,\quad N_{\bar{\nu}_\mu}=5,5,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=16,16,\quad N_{e\bar{\nu}_e}=16,16,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$W^{184}_{74}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=5,5,\quad N_{\bar{\nu}_e}=5,5,$$
$$N_{\bar{\nu}_\mu}=4,4,\quad N_{\bar{\nu}_\tau}=4,4,\quad N_{\epsilon\bar{\nu}_\epsilon}=10,10,\quad N_{e\bar{\nu}_e}=10,10,\quad N_{\mu\bar{\nu}_\mu}=9,9,\quad N_{\tau\bar{\nu}_\tau}=8,8,$$

$$Re^{186}_{75}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,$$
$$N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15\to N_{\bar{\nu}_\epsilon}=6,6,\quad N_{\bar{\nu}_e}=6,6,\quad N_{\bar{\nu}_\mu}=5,5,$$
$$N_{\bar{\nu}_\tau}=1,1,\quad N_{\epsilon\bar{\nu}_\epsilon}=17,17,\quad N_{e\bar{\nu}_e}=16,16,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Os_{76}^{190} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O^L_{\bar{\nu}_\tau},\ O^R_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O^L_{\tau\bar{\nu}_\tau},\ O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,\ N^o_{e\bar{\nu}_e} = 11,12,\ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ N^o_{\tau\bar{\nu}_\tau} = 15,16 \to N_{\bar{\nu}_\epsilon} = 5,5,\ N_{\bar{\nu}_e} = 5,5,$$
$$N_{\bar{\nu}_\mu} = 5,5,\ N_{\bar{\nu}_\tau} = 4,4,\ N_{\epsilon\bar{\nu}_\epsilon} = 11,11,\ N_{e\bar{\nu}_e} = 10,10,\ N_{\mu\bar{\nu}_\mu} = 9,9,\ N_{\tau\bar{\nu}_\tau} = 8,8,$$

$$Ir_{77}^{192} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O^L_{\bar{\nu}_\tau},\ O^R_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,8,\ N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,$$
$$N^o_{e\bar{\nu}_e} = 11,12,\ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ N^o_{\tau\bar{\nu}_\tau} = 15 \to N_{\bar{\nu}_\epsilon} = 6,6,\ N_{\bar{\nu}_e} = 6,6,\ N_{\bar{\nu}_\mu} = 6,6,$$
$$N_{\bar{\nu}_\tau} = 1,1,\ N_{\epsilon\bar{\nu}_\epsilon} = 17,17,\ N_{e\bar{\nu}_e} = 17,17,\ N_{\mu\bar{\nu}_\mu} = 4,4,\ N_{\tau\bar{\nu}_\tau} = 1,$$

$$Pt_{78}^{195} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O^L_{\tau\bar{\nu}_\tau},\ O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,\ N^o_{e\bar{\nu}_e} = 10,11,\ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ N^o_{\tau\bar{\nu}_\tau} = 14,15 \to N_{\bar{\nu}_\epsilon} = 7,7,\ N_{\bar{\nu}_e} = 6,6,$$
$$N_{\bar{\nu}_\mu} = 6,6,\ N_{\bar{\nu}_\tau} = 1,\ N_{\epsilon\bar{\nu}_\epsilon} = 11,11,\ N_{e\bar{\nu}_e} = 10,10,\ N_{\mu\bar{\nu}_\mu} = 9,9,\ N_{\tau\bar{\nu}_\tau} = 9,9,$$

$$Au_{79}^{197} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,\ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 7,7,\ N_{\bar{\nu}_e} = 6,6,\ N_{\bar{\nu}_\mu} = 6,6$$
$$N_{\bar{\nu}_\tau} = 1,\ N_{\epsilon\bar{\nu}_\epsilon} = 18,18,\ N_{e\bar{\nu}_e} = 17,17,\ N_{\mu\bar{\nu}_\mu} = 4,4,\ N_{\tau\bar{\nu}_\tau} = 1,$$

$$Hg_{80}^{200} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O^L_{\bar{\nu}_\tau},\ O^R_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O^L_{\tau\bar{\nu}_\tau},\ O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,\ N^o_{e\bar{\nu}_e} = 11,12,\ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ N^o_{\tau\bar{\nu}_\tau} = 15,16 \to N_{\bar{\nu}_\epsilon} = 6,6,\ N_{\bar{\nu}_e} = 5,5,$$
$$N_{\bar{\nu}_\mu} = 5,5,\ N_{\bar{\nu}_\tau} = 4,4,\ N_{\epsilon\bar{\nu}_\epsilon} = 11,11,\ N_{e\bar{\nu}_e} = 10,10,\ N_{\mu\bar{\nu}_\mu} = 10,10,\ N_{\tau\bar{\nu}_\tau} = 9,9,$$

$$Tl_{81}^{204} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O^L_{\bar{\nu}_\tau},\ O^R_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,8,\ N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,$$
$$N^o_{e\bar{\nu}_e} = 11,12,\ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ N^o_{\tau\bar{\nu}_\tau} = 15 \to N_{\bar{\nu}_\epsilon} = 7,7,\ N_{\bar{\nu}_e} = 7,7,\ N_{\bar{\nu}_\mu} = 6,6,$$
$$N_{\bar{\nu}_\tau} = 1,1,\ N_{\epsilon\bar{\nu}_\epsilon} = 18,18,\ N_{e\bar{\nu}_e} = 18,18,\ N_{\mu\bar{\nu}_\mu} = 4,4,\ N_{\tau\bar{\nu}_\tau} = 1,$$

$$Pb_{82}^{207} \to O^L_{\bar{\nu}_\epsilon},\ O^R_{\bar{\nu}_\epsilon},\ O^L_{\bar{\nu}_e},\ O^R_{\bar{\nu}_e},\ O^L_{\bar{\nu}_\mu},\ O^R_{\bar{\nu}_\mu},\ O_{\bar{\nu}_\tau},\ O^L_{\epsilon\bar{\nu}_\epsilon},\ O^R_{\epsilon\bar{\nu}_\epsilon},\ O^L_{e\bar{\nu}_e},\ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ O^R_{\mu\bar{\nu}_\mu},\ O^L_{\tau\bar{\nu}_\tau},\ O^R_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1,2,\ N^o_{\bar{\nu}_e} = 3,4\ N^o_{\bar{\nu}_\mu} = 5,6,\ N^o_{\bar{\nu}_\tau} = 7,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,\ N^o_{e\bar{\nu}_e} = 10,11,\ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ N^o_{\tau\bar{\nu}_\tau} = 14,15 \to N_{\bar{\nu}_\epsilon} = 7,7,\ N_{\bar{\nu}_e} = 7,7,$$

$$N_{\bar{\nu}_\mu}=7,7,\quad N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=11,11,\quad N_{e\bar{\nu}_e}=10,10,\quad N_{\mu\bar{\nu}_\mu}=10,10,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$Bi^{209}_{83}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=7,7,\quad N_{\bar{\nu}_e}=7,7,\quad N_{\bar{\nu}_\mu}=7,7,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=19,19,\quad N_{e\bar{\nu}_e}=18,18,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Po^{209}_{84}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,\quad N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14,15\to N_{\bar{\nu}_\epsilon}=7,7,\quad N_{\bar{\nu}_e}=7,7,$$
$$N_{\bar{\nu}_\mu}=6,6,\quad N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=11,11,\quad N_{e\bar{\nu}_e}=11,11,\quad N_{\mu\bar{\nu}_\mu}=10,10,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$At^{210}_{85}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^L_{\bar{\nu}_\tau},\ \ O^R_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,$$
$$N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15\to N_{\bar{\nu}_\epsilon}=6,6,\quad N_{\bar{\nu}_e}=5,5,\quad N_{\bar{\nu}_\mu}=5,5,$$
$$N_{\bar{\nu}_\tau}=4,4,\quad N_{\epsilon\bar{\nu}_\epsilon}=19,19,\quad N_{e\bar{\nu}_e}=19,19,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Rn^{222}_{86}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^L_{\bar{\nu}_\tau},\ \ O^R_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=7,7,\quad N_{\bar{\nu}_e}=6,6,$$
$$N_{\bar{\nu}_\mu}=6,6,\quad N_{\bar{\nu}_\tau}=6,6,\quad N_{\epsilon\bar{\nu}_\epsilon}=11,11,\quad N_{e\bar{\nu}_e}=11,11,\quad N_{\mu\bar{\nu}_\mu}=11,11,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$Fr^{223}_{87}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^{L,R}_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=8,8,\quad N_{\bar{\nu}_e}=8,8,\quad N_{\bar{\nu}_\mu}=8,8,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=20,20,\quad N_{e\bar{\nu}_e}=19,19,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Ra^{226}_{88}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^L_{\bar{\nu}_\tau},\ \ O^R_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=7,7,\quad N_{\bar{\nu}_e}=6,6,$$
$$N_{\bar{\nu}_\mu}=6,6,\quad N_{\bar{\nu}_\tau}=6,6,\quad N_{\epsilon\bar{\nu}_\epsilon}=12,12,\quad N_{e\bar{\nu}_e}=11,11,\quad N_{\mu\bar{\nu}_\mu}=11,11,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$Ac^{227}_{89}\to O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^{L,R}_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$

$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=8,8,\quad N_{\bar{\nu}_e}=8,8,\quad N_{\bar{\nu}_\mu}=8,8,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=20,20,\quad N_{e\bar{\nu}_e}=20,20,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1.$$

They show that an orbit quantized succession is not changed even at the transition from one light atomic system into another more heavy one.

For completeness we present here a structural picture of atoms with atomic numbers from 90 to 103 in the disclosed form

$$Th^{232}_{90}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=7,7,\quad N_{\bar{\nu}_e}=7,7,$$
$$N_{\bar{\nu}_\mu}=6,6,\quad N_{\bar{\nu}_\tau}=6,6,\quad N_{\epsilon\bar{\nu}_\epsilon}=12,12,\quad N_{e\bar{\nu}_e}=12,12,\quad N_{\mu\bar{\nu}_\mu}=11,11,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$Pa^{231}_{91}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=8,8,\quad N_{\bar{\nu}_e}=8,8,\quad N_{\bar{\nu}_\mu}=8,8,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=21,21,\quad N_{e\bar{\nu}_e}=20,20,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$U^{238}_{92}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=8,8,\quad N_{\bar{\nu}_e}=7,7,$$
$$N_{\bar{\nu}_\mu}=6,6,\quad N_{\bar{\nu}_\tau}=6,6,\quad N_{\epsilon\bar{\nu}_\epsilon}=13,13,\quad N_{e\bar{\nu}_e}=12,12,\quad N_{\mu\bar{\nu}_\mu}=11,11,\quad N_{\tau\bar{\nu}_\tau}=10,10,$$

$$Np^{237}_{93}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=9,9,\quad N_{\bar{\nu}_e}=8,8,\quad N_{\bar{\nu}_\mu}=8,8,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=21,21,\quad N_{e\bar{\nu}_e}=21,21,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Pu^{244}_{94}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O^L_{\bar{\nu}_\tau},\quad O^R_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O^L_{\tau\bar{\nu}_\tau},\quad O^R_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,8,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon}=9,10,\quad N^o_{e\bar{\nu}_e}=11,12,\quad N^o_{\mu\bar{\nu}_\mu}=13,14,\quad N^o_{\tau\bar{\nu}_\tau}=15,16\to N_{\bar{\nu}_\epsilon}=8,8,\quad N_{\bar{\nu}_e}=7,7,$$
$$N_{\bar{\nu}_\mu}=7,7,\quad N_{\bar{\nu}_\tau}=6,6,\quad N_{\epsilon\bar{\nu}_\epsilon}=13,13,\quad N_{e\bar{\nu}_e}=12,12,\quad N_{\mu\bar{\nu}_\mu}=11,11,\quad N_{\tau\bar{\nu}_\tau}=11,11,$$

$$Am^{243}_{95}\to O^L_{\bar{\nu}_\epsilon},\quad O^R_{\bar{\nu}_\epsilon},\quad O^L_{\bar{\nu}_e},\quad O^R_{\bar{\nu}_e},\quad O^L_{\bar{\nu}_\mu},\quad O^R_{\bar{\nu}_\mu},\quad O_{\bar{\nu}_\tau},\quad O^L_{\epsilon\bar{\nu}_\epsilon},\quad O^R_{\epsilon\bar{\nu}_\epsilon},\quad O^L_{e\bar{\nu}_e},\quad O^R_{e\bar{\nu}_e},$$
$$O^L_{\mu\bar{\nu}_\mu},\quad O^R_{\mu\bar{\nu}_\mu},\quad O_{\tau\bar{\nu}_\tau}\to N^o_{\bar{\nu}_\epsilon}=1,2,\quad N^o_{\bar{\nu}_e}=3,4\quad N^o_{\bar{\nu}_\mu}=5,6,\quad N^o_{\bar{\nu}_\tau}=7,\quad N^o_{\epsilon\bar{\nu}_\epsilon}=8,9,$$
$$N^o_{e\bar{\nu}_e}=10,11,\quad N^o_{\mu\bar{\nu}_\mu}=12,13,\quad N^o_{\tau\bar{\nu}_\tau}=14\to N_{\bar{\nu}_\epsilon}=9,9,\quad N_{\bar{\nu}_e}=9,9,\quad N_{\bar{\nu}_\mu}=8,8,$$
$$N_{\bar{\nu}_\tau}=1,\quad N_{\epsilon\bar{\nu}_\epsilon}=22,22,\quad N_{e\bar{\nu}_e}=21,21,\quad N_{\mu\bar{\nu}_\mu}=4,4,\quad N_{\tau\bar{\nu}_\tau}=1,$$

$$Cm^{247}_{96} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},\ \ O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ \ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ \ N^o_{\tau\bar{\nu}_\tau} = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 10,10,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 8,8,$$
$$N_{\bar{\nu}_\tau} = 1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 13,13,\ \ N_{e\bar{\nu}_e} = 12,12,\ \ N_{\mu\bar{\nu}_\mu} = 12,12,\ \ N_{\tau\bar{\nu}_\tau} = 11,11,$$

$$Bk^{247}_{97} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ \ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ \ N^o_{\tau\bar{\nu}_\tau} = 14 \rightarrow N_{\bar{\nu}_\epsilon} = 9,9,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 8,8,$$
$$N_{\bar{\nu}_\tau} = 1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 22,22,\ \ N_{e\bar{\nu}_e} = 22,22,\ \ N_{\mu\bar{\nu}_\mu} = 4,4,\ \ N_{\tau\bar{\nu}_\tau} = 1,$$

$$Cf^{251}_{98} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},\ \ O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ \ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ \ N^o_{\tau\bar{\nu}_\tau} = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 10,10,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 8,8,$$
$$N_{\bar{\nu}_\tau} = 1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 13,13,\ \ N_{e\bar{\nu}_e} = 12,12,\ \ N_{\mu\bar{\nu}_\mu} = 12,12,\ \ N_{\tau\bar{\nu}_\tau} = 12,12,$$

$$Es^{254}_{99} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^L_{\bar{\nu}_\tau},\ \ O^R_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,8,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,$$
$$N^o_{e\bar{\nu}_e} = 11,12,\ \ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ \ N^o_{\tau\bar{\nu}_\tau} = 15 \rightarrow N_{\bar{\nu}_\epsilon} = 9,9,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 9,9,$$
$$N_{\bar{\nu}_\tau} = 1,1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 23,23,\ \ N_{e\bar{\nu}_e} = 22,22,\ \ N_{\mu\bar{\nu}_\mu} = 4,4,\ \ N_{\tau\bar{\nu}_\tau} = 1,$$

$$Fm^{257}_{100} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},\ \ O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ \ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ \ N^o_{\tau\bar{\nu}_\tau} = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 10,10,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 9,9,$$
$$N_{\bar{\nu}_\tau} = 1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 13,13,\ \ N_{e\bar{\nu}_e} = 13,13,\ \ N_{\mu\bar{\nu}_\mu} = 12,12,\ \ N_{\tau\bar{\nu}_\tau} = 12,12,$$

$$Md^{258}_{101} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O^L_{\bar{\nu}_\tau},\ \ O^R_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu},\ \ O^R_{\mu\bar{\nu}_\mu},\ \ O_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,8,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10,$$
$$N^o_{e\bar{\nu}_e} = 11,12,\ \ N^o_{\mu\bar{\nu}_\mu} = 13,14,\ \ N^o_{\tau\bar{\nu}_\tau} = 15 \rightarrow N_{\bar{\nu}_\epsilon} = 9,9,\ \ N_{\bar{\nu}_e} = 9,9,\ \ N_{\bar{\nu}_\mu} = 9,9,$$
$$N_{\bar{\nu}_\tau} = 1,1,\ \ N_{\epsilon\bar{\nu}_\epsilon} = 23,23,\ \ N_{e\bar{\nu}_e} = 23,23,\ \ N_{\mu\bar{\nu}_\mu} = 4,4,\ \ N_{\tau\bar{\nu}_\tau} = 1,$$

$$No^{255}_{102} \rightarrow O^L_{\bar{\nu}_\epsilon},\ \ O^R_{\bar{\nu}_\epsilon},\ \ O^L_{\bar{\nu}_e},\ \ O^R_{\bar{\nu}_e},\ \ O^L_{\bar{\nu}_\mu},\ \ O^R_{\bar{\nu}_\mu},\ \ O_{\bar{\nu}_\tau},\ \ O^L_{\epsilon\bar{\nu}_\epsilon},\ \ O^R_{\epsilon\bar{\nu}_\epsilon},\ \ O^L_{e\bar{\nu}_e},\ \ O^R_{e\bar{\nu}_e},\ \ O^L_{\mu\bar{\nu}_\mu},$$

$$O^R_{\mu\bar{\nu}_\mu},\ \ O^L_{\tau\bar{\nu}_\tau},\ \ O^R_{\tau\bar{\nu}_\tau} \rightarrow N^o_{\bar{\nu}_\epsilon} = 1,2,\ \ N^o_{\bar{\nu}_e} = 3,4\ \ N^o_{\bar{\nu}_\mu} = 5,6,\ \ N^o_{\bar{\nu}_\tau} = 7,\ \ N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9,$$
$$N^o_{e\bar{\nu}_e} = 10,11,\ \ N^o_{\mu\bar{\nu}_\mu} = 12,13,\ \ N^o_{\tau\bar{\nu}_\tau} = 14,15 \rightarrow N_{\bar{\nu}_\epsilon} = 9,9,\ \ N_{\bar{\nu}_e} = 8,8,\ \ N_{\bar{\nu}_\mu} = 8,8,$$

$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 13, 13, \quad N_{e\bar{\nu}_e} = 13, 13, \quad N_{\mu\bar{\nu}_\mu} = 13, 13, \quad N_{\tau\bar{\nu}_\tau} = 12, 12,$$

$$Lr^{256}_{103} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon}, \quad O^L_{e\bar{\nu}_e}, \quad O^R_{e\bar{\nu}_e},$$

$$O^L_{\mu\bar{\nu}_\mu}, \quad O^R_{\mu\bar{\nu}_\mu}, \quad O_{\tau\bar{\nu}_\tau} \to N^o_{\bar{\nu}_\epsilon} = 1, 2, \quad N^o_{\bar{\nu}_e} = 3, 4 \quad N^o_{\bar{\nu}_\mu} = 5, 6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8, 9,$$

$$N^o_{e\bar{\nu}_e} = 10, 11, \quad N^o_{\mu\bar{\nu}_\mu} = 12, 13, \quad N^o_{\tau\bar{\nu}_\tau} = 14 \to N_{\bar{\nu}_\epsilon} = 9, 9, \quad N_{\bar{\nu}_e} = 8, 8, \quad N_{\bar{\nu}_\mu} = 8, 8,$$

$$N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 24, 24, \quad N_{e\bar{\nu}_e} = 23, 23, \quad N_{\mu\bar{\nu}_\mu} = 4, 4, \quad N_{\tau\bar{\nu}_\tau} = 1.$$

Thus, it follows that between atomic orbits and leptonic families exists a range of the structural connections in which appears a part of mass. This does not indicate of course the existence in nature of a transition from one atom into another one regardless of what is the type of mass has for it important consequences.

## 4. Nature of a grand synthesis of nuclei

If an evrmion (antievrmion) interacts with the antiproton (proton), the appearance of a force of an atomic unification can in conformity with symmetry laws transform it into an orbital fermion. In this case, it is expected that hydrogen (antihydrogen) $H^A_Z(\bar{H}^A_Z)$ having the same orbit $O^L_\epsilon$ or $O^R_\epsilon$ is constituted in nature through the first lepton (antilepton) synthesis

$$\epsilon^-_{L,R} + p^+_{R,L} \to H^1_1, \quad \epsilon^+_{R,L} + p^-_{L,R} \to \bar{H}^1_1. \tag{45}$$

Of course, a given transition does not contradict the conditions (32), which would seem to say about that among the set of atomic systems one can find atoms of a single electron or muon orbit. This is, however, not in line with nature. In fact, a motion of an evrmion around the nucleus of hydrogen $H^1_1$ in his orbit is carried out in the warping field as a result of an interratio of intraatomic forces. They have at an evrmion universal mass the character of attraction. In another mass dependence would appear their property of a repulsion.

But there are the differences [14] in weak masses

$$m^W_\epsilon > m^W_e > m^W_\mu > m^W_p > m^W_\tau, \tag{46}$$

$$m^W_{\nu_\epsilon} > m^W_{\nu_e} > m^W_{\nu_\mu} > m^W_{\nu_\tau} > m^W_n \tag{47}$$

admitting the existence of a range of intraatomic weak transitions. An example for them may be naturally united processes

$$\epsilon^-_{L,R} + p^+_{R,L} \to \nu_{\epsilon L,R} + n^+_{R,L} + (\tau^-_{L,R}, \bar{\nu}_{\tau R,L}) + (\tau^+_{R,L}, \nu_{\tau L,R}), \tag{48}$$

$$\epsilon^+_{R,L} + p^-_{L,R} \to \bar{\nu}_{\epsilon R,L} + n^-_{L,R} + (\tau^-_{L,R}, \bar{\nu}_{\tau R,L}) + (\tau^+_{R,L}, \nu_{\tau L,R}). \tag{49}$$

Here an important circumstance is that the decays

$$\epsilon^-_{L,R} \to \tau^-_{L,R}\bar{\nu}_{\tau R,L}\nu_{\epsilon L,R}, \quad \epsilon^+_{R,L} \to \tau^+_{R,L}\nu_{\tau L,R}\bar{\nu}_{\epsilon R,L}, \tag{50}$$

$$p^-_{L,R} \to n^-_{L,R}\tau^-_{L,R}\bar{\nu}_{\tau R,L}, \quad p^+_{R,L} \to n^+_{R,L}\tau^+_{R,L}\nu_{\tau L,R} \tag{51}$$

take place at a formation of flavor symmetrical tauonic bosons (30) and

$$(\tau^+_R, \nu_{\tau L}), \quad (\tau^+_L, \nu_{\tau R}) \tag{52}$$

as the extremely fast weak lepton syntheses.

The connections of types (48) and (49) express one more of highly important regularities that at the availability of the interaction of the evrmionic antineutrino (neutrino) with the neutron (antineutron), the appearance of a force of an atomic unification must constitute the antineutrino (neutrino) hydrogen (antihydrogen) corresponding in nature to summed baryon and lepton number conservation. This system can be called an atom (antiatom) of Al-Fargoniy. For its denotation, it is relevant to use a symbol $Fn_N^A(\bar{F}n_N^A)$, which gives the possibility to write symbolically the first antineutrino (neutrino) synthesis

$$\bar{\nu}_{\epsilon R,L} + n_{L,R}^- \to Fn_1^1, \quad \nu_{\epsilon L,R} + n_{R,L}^+ \to \bar{F}n_1^1. \tag{53}$$

At first sight, (48) and (49) relate the processes

$$Fn_1^1 \to \bar{H}_Z^A, \quad \bar{F}n_1^1 \to H_1^1 \tag{54}$$

to weak emission. On the other hand, the explicit values of masses show that

$$m_l^E > m_{\nu_l}^E, \quad m_n^E > m_p^E, \tag{55}$$

$$m_l^W > m_{\nu_l}^W, \quad m_p^W > m_n^W, \tag{56}$$

and consequently, $Fn_1^1(\bar{F}n_1^1)$ cannot decay by means of weak interactions. However, its decay through the electric masses is not forbidden, since in

$$Fn_1^1 \to \bar{H}_1^1 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}), \quad \bar{F}n_1^1 \to H_1^1 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) \tag{57}$$

appears a crucial part of Coulomb transitions

$$n_{L,R}^- \to p_{L,R}^- \epsilon_{R,L}^+ \nu_{\epsilon L,R}, \quad n_{R,L}^+ \to p_{R,L}^+ \epsilon_{L,R}^- \bar{\nu}_{\epsilon R,L} \tag{58}$$

constituting the flavor symmetrical neutrino difermions

$$(\nu_{\epsilon L}, \bar{\nu}_{\epsilon R}), \quad (\nu_{\epsilon R}, \bar{\nu}_{\epsilon L}). \tag{59}$$

An antineutrino hydrogen $Fn_1^1$ can therefore interact not only with $H_1^1$ but also with other its isotopes

$$Fn_1^1 + H_1^1 \to H_1^2, \quad Fn_1^1 + H_1^2 \to H_1^3, \quad Fn_1^1 + H_1^3 \to H_1^4, \tag{60}$$

$$Fn_1^1 + H_1^4 \to H_1^5, \quad Fn_1^1 + H_1^5 \to H_1^6, \quad Fn_1^1 + H_1^6 \to H_1^7. \tag{61}$$

An order of orbits of these types of hydrogens behaves as

$$Fn_1^1 \to O_{\bar{\nu}_\epsilon} \to N_{\bar{\nu}_\epsilon}^o = 1 \to N_{\bar{\nu}_\epsilon} = 1,$$

$$H_1^1 \to O_\epsilon \to N_\epsilon^o = 1 \to N_\epsilon = 1,$$

$$H_1^2 \to O_{\epsilon\bar{\nu}_\epsilon} \to N_{\epsilon\bar{\nu}_\epsilon}^o = 1 \to N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$H_1^3 \to O_{\bar{\nu}_\epsilon}, \quad O_{\epsilon\bar{\nu}_\epsilon} \to N_{\bar{\nu}_\epsilon}^o = 1, \quad N_{\epsilon\bar{\nu}_\epsilon}^o = 2 \to N_{\bar{\nu}_\epsilon} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$H_1^4 \to O_{\bar{\nu}_\epsilon}^L, \quad O_{\bar{\nu}_\epsilon}^R, \quad O_{\epsilon\bar{\nu}_\epsilon} \to N_{\bar{\nu}_\epsilon}^o = 1,2, \quad N_{\epsilon\bar{\nu}_\epsilon}^o = 3 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$H_1^5 \to O_{\bar\nu_\epsilon}^L,\quad O_{\bar\nu_\epsilon}^R,\quad O_{\bar\nu_e},\quad O_{\epsilon\bar\nu_\epsilon} \to N_{\bar\nu_\epsilon}^o = 1,2,\quad N_{\bar\nu_e}^o = 3,$$

$$N_{\epsilon\bar\nu_\epsilon}^o = 4 \to N_{\bar\nu_\epsilon} = 1,1,\quad N_{\bar\nu_e} = 1,\quad N_{\epsilon\bar\nu_\epsilon} = 1,$$

$$H_1^6 \to O_{\bar\nu_\epsilon}^L,\quad O_{\bar\nu_\epsilon}^R,\quad O_{\bar\nu_e}^L,\quad O_{\bar\nu_e}^R,\quad O_{\epsilon\bar\nu_\epsilon} \to N_{\bar\nu_\epsilon}^o = 1,2,\quad N_{\bar\nu_e}^o = 3,4,$$

$$N_{\epsilon\bar\nu_\epsilon}^o = 5 \to N_{\bar\nu_\epsilon} = 1,1,\quad N_{\bar\nu_e} = 1,1,\quad N_{\epsilon\bar\nu_\epsilon} = 1,$$

$$H_1^7 \to O_{\bar\nu_\epsilon}^L,\quad O_{\bar\nu_\epsilon}^R,\quad O_{\bar\nu_e}^L,\quad O_{\bar\nu_e}^R,\quad O_{\bar\nu_\mu},\quad O_{\epsilon\bar\nu_\epsilon} \to N_{\bar\nu_\epsilon}^o = 1,2,\quad N_{\bar\nu_e}^o = 3,4,\quad N_{\bar\nu_\mu}^o = 5,$$

$$N_{\epsilon\bar\nu_\epsilon}^o = 6 \to N_{\bar\nu_\epsilon} = 1,1,\quad N_{\bar\nu_e} = 1,1,\quad N_{\bar\nu_\mu} = 1,\quad N_{\epsilon\bar\nu_\epsilon} = 1.$$

The appearance of an antineutrino orbit $O_{\bar\nu_e}$ in $H_1^5$ would seem to explain the availability in neutrinos of the possibility to constitute not only paraneutrinos (59) but also dineutrinos

$$(\nu_{\epsilon L}, \bar\nu_{eR}),\quad (\nu_{\epsilon R}, \bar\nu_{eL}). \tag{62}$$

At the same time, a neutrino string emission itself at the interaction of $Fn_1^1(\bar{F}n_1^1)$ with $H_1^4(\bar{H}_1^4)$ can be explained by the successive decays originating in orbit of an evrmionic boson by the schemes

$$\epsilon_{L,R}^- \to e_{L,R}^- \bar\nu_{eR,L} \nu_{\epsilon L,R},\quad \epsilon_{R,L}^+ \to e_{R,L}^+ \nu_{eL,R} \bar\nu_{\epsilon R,L}, \tag{63}$$

$$e_{L,R}^- \to \epsilon_{L,R}^- \bar\nu_{\epsilon R,L} \nu_{eL,R},\quad e_{R,L}^+ \to \epsilon_{R,L}^+ \nu_{\epsilon L,R} \bar\nu_{eR,L}. \tag{64}$$

The first of them are the results of weak masses responsible for

$$\epsilon_{L,R}^- \to \mu_{L,R}^- \bar\nu_{\mu R,L} \nu_{\epsilon L,R},\quad \epsilon_{R,L}^+ \to \mu_{R,L}^+ \nu_{\mu L,R} \bar\nu_{\epsilon R,L}, \tag{65}$$

$$\epsilon_{L,R}^- \to \tau_{L,R}^- \bar\nu_{\tau R,L} \nu_{\epsilon L,R},\quad \epsilon_{R,L}^+ \to \tau_{R,L}^+ \nu_{\tau L,R} \bar\nu_{\epsilon R,L}. \tag{66}$$

The decays (64) similarly to each of transitions

$$\mu_{L,R}^- \to \epsilon_{L,R}^- \bar\nu_{\epsilon R,L} \nu_{\mu L,R},\quad \mu_{R,L}^+ \to \epsilon_{R,L}^+ \nu_{\epsilon L,R} \bar\nu_{\mu R,L}, \tag{67}$$

$$\tau_{L,R}^- \to \epsilon_{L,R}^- \bar\nu_{\epsilon R,L} \nu_{\tau L,R},\quad \tau_{R,L}^+ \to \epsilon_{R,L}^+ \nu_{\epsilon L,R} \bar\nu_{\tau R,L} \tag{68}$$

must go at the expense of electric masses.

But, as stated in (63), the neutrino $\nu_{\epsilon L,R}$ and antineutrino $\bar\nu_{eR,L}$ at the level as were connected do not exist in (62) comparatively for a long time without restoration of the flavor symmetry of emission. They can herewith individually pass [21] from the usual left (right)-handed space into a mirror right (left)-handed one by the schemes

$$\nu_{lL} \to \nu_{lR} + \overline{\gamma}_L,\quad \nu_{lR} \to \nu_{lL} + \gamma_R, \tag{69}$$

$$\bar\nu_{lR} \to \bar\nu_{lL} + \gamma_R,\quad \bar\nu_{lL} \to \bar\nu_{lR} + \overline{\gamma}_L. \tag{70}$$

This corresponds in (61) to the fact that a transition

$$Fn_1^1 + H_1^4 \to H_1^5 + (\nu_{\epsilon L,R}, \bar\nu_{\epsilon R,L}) + (\gamma_R, \overline{\gamma}_L) \tag{71}$$

is carried out in our space-time with emission of a photon string, which relate [12] the two left (right)-handed photons in individual diphotons

$$(\gamma_L, \overline{\gamma}_R),\quad (\gamma_R, \overline{\gamma}_L), \tag{72}$$

confirming that a photobirth of neutrino pairs can intensively originate in an atomic system by the usual mode

$$\gamma_R \to \nu_{lR} + \bar{\nu}_{lR}, \quad \overline{\gamma}_L \to \nu_{lL} + \bar{\nu}_{lL}. \tag{73}$$

So it is seen that to the birth of any of mediate bosons $\gamma_R$ and $\overline{\gamma}_L$ can lead only those neutrinos, each of which has arisen from a decay of the same gauge boson. If such a neutrino is of leptonic families, it requires one to elucidate the ideas of any of (73) from the point of view of the legality of angular momentum conservation. For this we must at first recall the earlier experiments [22-24] about neutrino helicity, analysis of which says about the absence [25] in left (right)-handed fermions of atomic system of a kind of interaction with right (left)-handed photons due to the spontaneous mirror symmetry violation [21]. Instead they interact with all the left (right)-handed gauge bosons.

In such a case, from (65) and (66), we are led to a correspondence principle that an orbit quantized succession appears in the force dependence of an atomic unification. Therefore, the availability of $O^L_{\bar{\nu}_e}$ and $O^R_{\bar{\nu}_e}$ in $H^6_1$ confirms the existence of new types of hydrogens, constituted in transitions

$$Fn^1_1 + H^7_1 \to H^8_1, \quad Fn^1_1 + H^8_1 \to H^9_1, \quad Fn^1_1 + H^9_1 \to H^{10}_1. \tag{74}$$

Their orbits have the following orders:

$$H^8_1 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4,$$
$$N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 7 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$H^9_1 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1,$$
$$N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,$$

$$H^{10}_1 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\bar{\nu}_\tau}, \quad O^R_{\bar{\nu}_\tau}, \quad O_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7,8, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 9 \to N_{\bar{\nu}_\epsilon} = 1,1,$$
$$N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1.$$

The compound structure of all types of hydrogens $H^A_Z$ of mass number from 1 to 10 predicts one more naturally united regularity that to any type of leptonic family corresponds the two forms of isotopes $(N > Z)$ with antineutrino orbits of the same atom $(N = Z)$ of boson orbits.

However, in the arbitrary case of atomic system $X^A_Z$, any of these isotopes can appear in latent united processes

$$Fn^1_1 + X^A_Z \to X^{A+1}_Z + .... \tag{75}$$

Insofar as the isotopes $(Z > N)$ with lepton orbits of the same atomic system $(N = Z)$ of boson orbits are concerned, they are the consequences of a grand synthesis of nuclei

$$\bar{F}n^1_1 + X^A_Z \to X^{A-1}_Z + .... \tag{76}$$

To such processes refer the transitions

$$\bar{F}n^1_1 + He^4_2 \to He^3_2, \quad \bar{F}n^1_1 + He^3_2 \to He^2_2, \quad \bar{F}n^1_1 + F^{18}_9 \to F^{17}_9, \tag{77}$$

the second of which constitutes the new type of an isotope of helium.

It is not surprising therefore that if (60), (61) and (74) exist, then, for example, the neutrino antihydrogen $\bar{F}n_1^1$ successively interacts with each of $H_1^{10}$, ..., $H_1^2$ until $H_1^2$ is able to constitute $H_1^1$ by the photon string emission laws. Of course, a role of $Fn_1^1$ and $\bar{F}n_1^1$ in (75) and (76) has remained a latent, and the transitions $X_Z^A \leftrightarrow X_Z^{A+1}$ were always accepted as the decays.

## 5. A latent dynamics of spontaneous atomic system emission

We see that a decay of $n^-_{L,R}(n^+_{R,L})$ cannot carry out in (57) by a scheme

$$n^-_{L,R} \to p^-_{L,R}e^+_{R,L}\nu_{eL,R}, \quad n^+_{R,L} \to p^+_{R,L}e^-_{L,R}\bar{\nu}_{eR,L}, \tag{78}$$

although this is not forbidden by masses of a Coulomb nature. Its absence in the nucleus of an atom of Al-Fargoniy expresses the idea about that an orbital neutrino flavor comes forward in orbit as a criterion for a kind of mode of the corresponding to it neutron decay. In other words, a decay such as (78) exists only in nuclei having orbits with neutrinos of an electronic family. Therefore, in conformity with implications of an orbit quantization law, we must recognize that the $\beta$-decays of $\bar{F}n_2^2$ and $\bar{F}n_2^3$ can spontaneously originate without an evrmion as well as without neutrino by the same single way

$$\bar{F}n_2^2 \to He_2^2 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}). \tag{79}$$

$$\bar{F}n_2^3 \to He_2^3 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}). \tag{80}$$

Coulomb masses responsible for (58), (79) and (80) predict the birth of well known $\alpha$-particle in a decay of $\bar{F}n_2^4$ by a scheme

$$\bar{F}n_2^4 \to He_2^4 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}). \tag{81}$$

In the presence of orbits with electronic neutrinos, Coulomb transitions (64) and (78) transform $\bar{F}n_2^5$ and $\bar{F}n_2^6$ into the following isotopes of helium:

$$\bar{F}n_2^5 \to He_2^5 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\nu_{eL,R}, \bar{\nu}_{eR,L}), \tag{82}$$

$$\bar{F}n_2^6 \to He_2^6 + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\nu_{eL,R}, \bar{\nu}_{eR,L}). \tag{83}$$

At the successive origination of (58), (65), (67), (69) and (70), the antihydrogens $\bar{F}n_2^7$ and $\bar{F}n_2^8$ suffer a strong structural change

$$\bar{F}n_2^7 \to He_2^7 + (\nu_{\mu L,R}, \bar{\nu}_{\mu R,L}) + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\gamma_R, \overline{\gamma}_L), \tag{84}$$

$$\bar{F}n_2^8 \to He_2^8 + (\nu_{\mu L,R}, \bar{\nu}_{\mu R,L}) + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\gamma_R, \overline{\gamma}_L). \tag{85}$$

Orbital analysis of atomic systems $\bar{F}n_2^9$ and $\bar{F}n_2^{10}$ shows that at the successive decays (58), (66) and (68)-(70), they are reduced to other isotopes of helium

$$\bar{F}n_2^9 \to He_2^9 + (\nu_{\tau L,R}, \bar{\nu}_{\tau R,L}) + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\gamma_R, \overline{\gamma}_L), \tag{86}$$

$$\bar{F}n_2^{10} \to He_2^{10} + (\nu_{\tau L,R}, \bar{\nu}_{\tau R,L}) + (\nu_{\epsilon L,R}, \bar{\nu}_{\epsilon R,L}) + (\gamma_R, \overline{\gamma}_L). \tag{87}$$

It was mentioned earlier that helium $He_2^4$ possesses the two boson orbits, the first of which in its isotope $He_2^3$ must be converted into a lepton one. All other isotopes of helium have the orbits in the following order:

$$He_2^2 \to O_\epsilon^L, \quad O_\epsilon^R \to N_\epsilon^o = 1, 2 \to N_\epsilon = 1, 1,$$

$$He_2^5 \to O_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 2,3 \to N_{\bar{\nu}_\epsilon} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^6 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 3,4 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^7 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 4,5 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^8 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4,$$
$$N^o_{\epsilon\bar{\nu}_\epsilon} = 5,6 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^9 \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4,$$
$$N^o_{\bar{\nu}_\mu} = 5, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 6,7 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^{10} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2, \quad N^o_{\bar{\nu}_e} = 3,4,$$
$$N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 7,8 \to N_{\bar{\nu}_\epsilon} = 1,1, \quad N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1.$$

Comparing their structure, it is easy to observe one of highly important consequences of an orbit quantization law, which says about the existence in $He_2^4$ of two more most heavy isotopes

$$Fn_1^1 + He_2^{10} \to He_2^{11}, \quad Fn_1^1 + He_2^{11} \to He_2^{12}. \tag{88}$$

An orbit quantized succession comes forward in them as

$$He_2^{11} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 8,9 \to N_{\bar{\nu}_\epsilon} = 1,1,$$
$$N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1,$$

$$He_2^{12} \to O^L_{\bar{\nu}_\epsilon}, \quad O^R_{\bar{\nu}_\epsilon}, \quad O^L_{\bar{\nu}_e}, \quad O^R_{\bar{\nu}_e}, \quad O^L_{\bar{\nu}_\mu}, \quad O^R_{\bar{\nu}_\mu}, \quad O^L_{\bar{\nu}_\tau}, \quad O^R_{\bar{\nu}_\tau}, \quad O^L_{\epsilon\bar{\nu}_\epsilon}, \quad O^R_{\epsilon\bar{\nu}_\epsilon} \to N^o_{\bar{\nu}_\epsilon} = 1,2,$$
$$N^o_{\bar{\nu}_e} = 3,4, \quad N^o_{\bar{\nu}_\mu} = 5,6, \quad N^o_{\bar{\nu}_\tau} = 7,8, \quad N^o_{\epsilon\bar{\nu}_\epsilon} = 9,10 \to N_{\bar{\nu}_\epsilon} = 1,1,$$
$$N_{\bar{\nu}_e} = 1,1, \quad N_{\bar{\nu}_\mu} = 1,1, \quad N_{\bar{\nu}_\tau} = 1,1, \quad N_{\epsilon\bar{\nu}_\epsilon} = 1,1.$$

A feature of this picture is a principle that regardless of whether or not another family of leptons exists, a quantity of antineutrino orbits corresponding in atom to the same flavor is equal to two.

Thus, if an orbital structure of atomic systems is not quite in line with ideas of an orbit quantization law, it reflects the availability in them of so far unobserved some latent isotopes.

Finally, insofar as an atom spontaneous $\gamma$-emission is concerned, its dynamical origination is basically connected with the $\beta$-decay of a neutron or an antiproton, because in it appear necessary for a formation of photons antiparticles of intraatomic particles. For example, at the transitions

$$H_1^2 \to 3\gamma_{L,R}, \quad H_1^3 \to 3\gamma_{L,R} + Fn_1^1 \tag{89}$$

as well as at other $\gamma$-emissions with atomic systems.

It is not excluded, however, that nature itself is not in force to constitute any atomic system, around which would appear an absolute emptiness. In other words, we cannot find the same atoms regardless of the structure of medium in which they move. If, for example, any of atomic systems having the string orbits interacts with a neutrino antihydrogen of Al-Fargoniy, the latter similarly in (76) will transform one of its boson orbits into a lepton one. This is carried out in nature in conformity with individual diphoton emission laws.

## 6. A unified spectral structure of atoms

A maximal quantity of all types of atomic orbits is equal to the same redoubled number of flavors. But of them lepton orbits appear in atom with boson orbits only if antiprotons of its nucleus are in excess. In contrast to this, antineutrino orbits must appear in the presence in a nucleus of orbital strings of excess neutrons. In both atoms a spinless nucleus without isospin is necessarily present.

To express the idea more clearly, one must refer to the above isotopes of hydrogen, because $H_1^2$ is their root coming forward as the stem of an hydrogen family of atomic systems. In a similar way, one can reanalyze the isotopes of helium. In a given case, from our earlier developments, we find that $He_2^4$ must be accepted as a root of all its isotopes. They constitute herewith the stem of an helium family of atoms.

Furthermore, if the interaction of the neutrino antihydrogen of Al-Fargoniy with each of the available atomic systems of boson and antineutrino orbits is not forbidden by any conservation laws until it loses his latter antineutrino orbit and all its boson orbits will be converted into the lepton ones, then there arises an impression that nature itself characterizes each atom by a root that constitutes the stem of its family. Thereby, it emphasizes that whatever the atomic families a root of any atoms of boson and lepton orbits has suffered a fully latent interaction with an antineutrino hydrogen of Al-Fargoniy. Under such circumstances, a set of atomic roots $X_Z^{2Z}$ is a latent united system of atoms.

Unification of this type suggests a connection

$$Fn_2^2 + He_2^2 = He_2^4, \quad Fn_3^3 + Li_3^3 = Li_3^6, \tag{90}$$

$$Fn_4^4 + Be_4^4 = Be_4^8, \quad Fn_5^5 + B_5^5 = B_5^{10}, ... \tag{91}$$

and that, consequently, $Fn_N^N$ play a role of one of the two atoms forming the root of a stem of each of the existing types of atomic families

$$Fn_N^N + X_Z^Z = X_Z^{2Z}. \tag{92}$$

So we must recognize that in the arbitrary case of an atom $X_Z^A$, the numbers of isotopes $(I)$ of lepton $(N_l^I)$ and antineutrino $(N_{\bar{\nu}_l}^I)$ orbits of its root $X_Z^{2Z}$ are equal to

$$N_l^I = Z, \quad N_{\bar{\nu}_l}^I = \begin{cases} 2L_l & \text{for} \quad Z = N = 1, \\ 2ZL_l & \text{for} \quad Z = N > 1. \end{cases} \tag{93}$$

Such a principle shows that full number $N_{full}^I$ of isotopes that constitute the same atomic family is intimately connected with the quantity of lepton flavors

$$N_{full}^I = N_l^I + N_{\bar{\nu}_l}^I. \tag{94}$$

If we choose $H_1^2$ from the united system of atomic roots $X_Z^{2Z}$, its family consists of ten atoms. An helium family includes eighteen forms of atomic systems. Therefore, they may symbolically be written as

$$H_1^2 \to N_l^I = 1, \quad N_{\bar{\nu}_l}^I = 8 \to N_{full}^I = 9 \to H_1^1, ..., H_1^{10},$$

$$He_2^4 \to N_l^I = 2, \quad N_{\bar{\nu}_l}^I = 16 \to N_{full}^I = 18 \to He_2^2, ..., He_2^{19}.$$

This united presentation in turn indicates to the existence in nature of those types of heliums, mass number of which lies in the limits of from 2 to 19 nucleons of a nucleus.

One can also find from (90)-(94) that

$$Li_3^6 \to N_l^I = 3, \quad N_{\bar{\nu}_l}^I = 24 \to N_{full}^I = 27 \to Li_3^3, ..., Li_3^{28},$$

$$Be_4^8 \to N_l^I = 4, \quad N_{\bar{\nu}_l}^I = 32 \to N_{full}^I = 36 \to Be_4^4, ..., Be_4^{37},$$

$$B_5^{10} \to N_l^I = 5, \quad N_{\bar{\nu}_l}^I = 40 \to N_{full}^I = 45 \to B_5^5, ..., B_5^{46},$$

$$C_6^{12} \to N_l^I = 6, \quad N_{\bar{\nu}_l}^I = 48 \to N_{full}^I = 54 \to C_6^6, ..., C_6^{55},$$

$$N_7^{14} \to N_l^I = 7, \quad N_{\bar{\nu}_l}^I = 56 \to N_{full}^I = 63 \to N_7^7, ..., N_7^{64},$$

$$O_8^{16} \to N_l^I = 8, \quad N_{\bar{\nu}_l}^I = 64 \to N_{full}^I = 72 \to O_8^8, ..., O_8^{73},$$

$$F_9^{18} \to N_l^I = 9, \quad N_{\bar{\nu}_l}^I = 72 \to N_{full}^I = 81 \to F_9^9, ..., F_9^{82},$$

$$Ne_{10}^{20} \to N_l^I = 10, \quad N_{\bar{\nu}_l}^I = 80 \to N_{full}^I = 90 \to Ne_{10}^{10}, ..., Ne_{10}^{91},$$

$$Na_{11}^{22} \to N_l^I = 11, \quad N_{\bar{\nu}_l}^I = 88 \to N_{full}^I = 99 \to Na_{11}^{11}, ..., Na_{11}^{100},$$

$$Mg_{12}^{24} \to N_l^I = 12, \quad N_{\bar{\nu}_l}^I = 96 \to N_{full}^I = 108 \to Mg_{12}^{12}, ..., Mg_{12}^{109},$$

$$Al_{13}^{26} \to N_l^I = 13, \quad N_{\bar{\nu}_l}^I = 104 \to N_{full}^I = 117 \to Al_{13}^{13}, ..., Al_{13}^{118},$$

$$Si_{14}^{28} \to N_l^I = 14, \quad N_{\bar{\nu}_l}^I = 112 \to N_{full}^I = 126 \to Si_{14}^{14}, ..., Si_{14}^{127},$$

$$P_{15}^{30} \to N_l^I = 15, \quad N_{\bar{\nu}_l}^I = 120 \to N_{full}^I = 135 \to P_{15}^{15}, ..., P_{15}^{136},$$

$$S_{16}^{32} \to N_l^I = 16, \quad N_{\bar{\nu}_l}^I = 128 \to N_{full}^I = 144, \to S_{16}^{16}, ..., S_{16}^{145},$$

$$Cl_{17}^{34} \to N_l^I = 17, \quad N_{\bar{\nu}_l}^I = 136 \to N_{full}^I = 153 \to Cl_{17}^{17}, ..., Cl_{17}^{154},$$

$$Ar_{18}^{36} \to N_l^I = 18, \quad N_{\bar{\nu}_l}^I = 144 \to N_{full}^I = 162 \to Ar_{18}^{18}, ..., Ar_{18}^{163},$$

$$K_{19}^{38} \to N_l^I = 19, \quad N_{\bar{\nu}_l}^I = 152 \to N_{full}^I = 171 \to K_{19}^{19}, ..., K_{19}^{172},$$

$$Ca_{20}^{40} \to N_l^I = 20, \quad N_{\bar{\nu}_l}^I = 160 \to N_{full}^I = 180 \to Ca_{20}^{20}, ..., Ca_{20}^{181}.$$

A theory of atomic systems describing the families of these types predicts the quantity of isotopes in roots of atoms with atomic numbers from 21 to 57 as follows:

$$Sc_{21}^{42} \to N_l^I = 21, \quad N_{\bar{\nu}_l}^I = 168 \to N_{full}^I = 189 \to Sc_{21}^{21}, ..., Sc_{21}^{190},$$

$$Ti_{22}^{44} \to N_l^I = 22, \quad N_{\bar{\nu}_l}^I = 176 \to N_{full}^I = 198 \to Ti_{22}^{22}, ..., Ti_{22}^{199},$$

$$V_{23}^{46} \to N_l^I = 23, \quad N_{\bar{\nu}_l}^I = 184 \to N_{full}^I = 207 \to V_{23}^{23}, ..., V_{23}^{208},$$

$$Cr_{24}^{48} \to N_l^I = 24, \quad N_{\bar{\nu}_l}^I = 192 \to N_{full}^I = 216 \to Cr_{24}^{24}, ..., Cr_{24}^{217},$$

$$Mn_{25}^{50} \to N_l^I = 25, \quad N_{\bar{\nu}_l}^I = 200 \to N_{full}^I = 225 \to Mn_{25}^{25}, ..., Mn_{25}^{226},$$

$$Fe_{26}^{52} \to N_l^I = 26, \quad N_{\bar{\nu}_l}^I = 208 \to N_{full}^I = 234 \to Fe_{26}^{26}, ..., Fe_{26}^{235},$$

$$Co_{27}^{54} \to N_l^I = 27, \quad N_{\bar{\nu}_l}^I = 216 \to N_{full}^I = 243 \to Co_{27}^{27}, ..., Co_{27}^{244},$$

$$Ni_{28}^{56} \to N_l^I = 28, \quad N_{\bar{\nu}_l}^I = 224 \to N_{full}^I = 252 \to Ni_{28}^{28}, ..., Ni_{28}^{253},$$

$$Cu_{29}^{58} \to N_l^I = 29, \quad N_{\bar{\nu}_l}^I = 232 \to N_{full}^I = 261 \to Cu_{29}^{29}, ..., Cu_{29}^{262},$$

$$Zn_{30}^{60} \to N_l^I = 30, \quad N_{\bar{\nu}_l}^I = 240 \to N_{full}^I = 270 \to Zn_{30}^{30}, ..., Zn_{30}^{271},$$

$$Ga_{31}^{62} \to N_l^I = 31, \quad N_{\bar{\nu}_l}^I = 248 \to N_{full}^I = 279 \to Ga_{31}^{31}, ..., Ga_{31}^{280},$$

$$Ge_{32}^{64} \to N_l^I = 32, \quad N_{\bar{\nu}_l}^I = 256 \to N_{full}^I = 288 \to Ge_{32}^{32}, ..., Ge_{32}^{289},$$

$$As_{33}^{66} \to N_l^I = 33, \quad N_{\bar{\nu}_l}^I = 264 \to N_{full}^I = 297 \to As_{33}^{33}, ..., As_{33}^{298},$$

$$Se_{34}^{68} \to N_l^I = 34, \quad N_{\bar{\nu}_l}^I = 272 \to N_{full}^I = 306 \to Se_{34}^{34}, ..., Se_{34}^{307},$$

$$Br_{35}^{70} \to N_l^I = 35, \quad N_{\bar{\nu}_l}^I = 280 \to N_{full}^I = 315 \to Br_{35}^{35}, ..., Br_{35}^{316},$$

$$Kr_{36}^{72} \to N_l^I = 36, \quad N_{\bar{\nu}_l}^I = 288 \to N_{full}^I = 324 \to Kr_{36}^{36}, ..., Kr_{36}^{325},$$

$$Rb_{37}^{74} \to N_l^I = 37, \quad N_{\bar{\nu}_l}^I = 296 \to N_{full}^I = 333 \to Rb_{37}^{37}, ..., Rb_{37}^{334},$$

$$Sr_{38}^{76} \to N_l^I = 38, \quad N_{\bar{\nu}_l}^I = 304 \to N_{full}^I = 342 \to Sr_{38}^{38}, ..., Sr_{38}^{343},$$

$$Y_{39}^{78} \to N_l^I = 39, \quad N_{\bar{\nu}_l}^I = 312 \to N_{full}^I = 351 \to Y_{39}^{39}, ..., Y_{39}^{352},$$

$$Zr_{40}^{80} \to N_l^I = 40, \quad N_{\bar{\nu}_l}^I = 320 \to N_{full}^I = 360 \to Zr_{40}^{40}, ..., Zr_{40}^{361},$$

$$Nb_{41}^{82} \to N_l^I = 41, \quad N_{\bar{\nu}_l}^I = 328 \to N_{full}^I = 369 \to Nb_{41}^{41}, ..., Nb_{41}^{370},$$

$$Mo_{42}^{84} \to N_l^I = 42, \quad N_{\bar{\nu}_l}^I = 336 \to N_{full}^I = 378 \to Mo_{42}^{42}, ..., Mo_{42}^{379},$$

$$Tc_{43}^{86} \to N_l^I = 43, \quad N_{\bar{\nu}_l}^I = 344 \to N_{full}^I = 387 \to Tc_{43}^{43}, ..., Tc_{43}^{388},$$

$$Ru_{44}^{88} \to N_l^I = 44, \quad N_{\bar{\nu}_l}^I = 352 \to N_{full}^I = 396 \to Ru_{44}^{44}, ..., Ru_{44}^{397},$$

$$Rh_{45}^{90} \to N_l^I = 45, \quad N_{\bar{\nu}_l}^I = 360 \to N_{full}^I = 405 \to Rh_{45}^{45}, ..., Rh_{45}^{406},$$

$$Pd_{46}^{92} \to N_l^I = 46, \quad N_{\bar{\nu}_l}^I = 368 \to N_{full}^I = 414 \to Pd_{46}^{46}, ..., Pd_{46}^{415},$$

$$Ag_{47}^{94} \to N_l^I = 47, \quad N_{\bar{\nu}_l}^I = 376 \to N_{full}^I = 423 \to Ag_{47}^{47}, ..., Ag_{47}^{424},$$

$$Cd_{48}^{96} \to N_l^I = 48, \quad N_{\bar{\nu}_l}^I = 384 \to N_{full}^I = 432 \to Cd_{48}^{48}, ..., Cd_{48}^{433},$$

$$In_{49}^{98} \to N_l^I = 49, \quad N_{\bar{\nu}_l}^I = 392 \to N_{full}^I = 441 \to In_{49}^{49}, ..., In_{49}^{442},$$

$$Sn_{50}^{100} \to N_l^I = 50, \quad N_{\bar{\nu}_l}^I = 400 \to N_{full}^I = 450 \to Sn_{50}^{50}, ..., Sn_{50}^{451},$$

$$Sb_{51}^{102} \to N_l^I = 51, \quad N_{\bar{\nu}_l}^I = 408 \to N_{full}^I = 459 \to Sb_{51}^{51}, ..., Sb_{51}^{460},$$

$$Te_{52}^{104} \to N_l^I = 52, \quad N_{\bar{\nu}_l}^I = 416 \to N_{full}^I = 468 \to Te_{52}^{52}, ..., Te_{52}^{469},$$

$$I_{53}^{106} \to N_l^I = 53, \quad N_{\bar{\nu}_l}^I = 424 \to N_{full}^I = 477 \to I_{53}^{53}, ..., I_{53}^{478},$$

$$Xe_{54}^{108} \to N_l^I = 54, \quad N_{\bar{\nu}_l}^I = 432 \to N_{full}^I = 486 \to Xe_{54}^{54}, ..., Xe_{54}^{487},$$

$$Cs_{55}^{110} \to N_l^I = 55, \quad N_{\bar{\nu}_l}^I = 440 \to N_{full}^I = 495 \to Cs_{55}^{55}, ..., Cs_{55}^{496},$$

$$Ba_{56}^{112} \to N_l^I = 56, \quad N_{\bar{\nu}_l}^I = 448 \to N_{full}^I = 504 \to Ba_{56}^{56}, ..., Ba_{56}^{505},$$

$$La_{57}^{114} \to N_l^I = 57, \quad N_{\bar{\nu}_l}^I = 456 \to N_{full}^I = 513 \to La_{57}^{57}, ..., La_{57}^{514}.$$

A mechanism responsible for this order defines the family structure of atomic roots of mass number from 116 to 142 in the form

$$Ce_{58}^{116} \to N_l^I = 58, \quad N_{\bar{\nu}_l}^I = 464 \to N_{full}^I = 522 \to Ce_{58}^{58}, ..., Ce_{58}^{523},$$

$$Pr_{59}^{118} \to N_l^I = 59, \quad N_{\bar{\nu}_l}^I = 472 \to N_{full}^I = 531 \to Pr_{59}^{59}, ..., Pr_{59}^{532},$$

$$Nd_{60}^{120} \to N_l^I = 60, \quad N_{\bar{\nu}_l}^I = 480 \to N_{full}^I = 540 \to Nd_{60}^{60}, ..., Nd_{60}^{541},$$

$$Pm_{61}^{122} \to N_l^I = 61, \quad N_{\bar{\nu}_l}^I = 488 \to N_{full}^I = 549 \to Pm_{61}^{61}, ..., Pm_{61}^{550},$$

$$Sm_{62}^{124} \to N_l^I = 62, \quad N_{\bar{\nu}_l}^I = 496 \to N_{full}^I = 558 \to Sm_{62}^{62}, ..., Sm_{62}^{559},$$

$$Eu_{63}^{126} \to N_l^I = 63, \quad N_{\bar{\nu}_l}^I = 504 \to N_{full}^I = 567 \to Eu_{63}^{63}, ..., Eu_{63}^{568},$$

$$Gd_{64}^{128} \to N_l^I = 64, \quad N_{\bar{\nu}_l}^I = 512 \to N_{full}^I = 576 \to Gd_{64}^{64}, ..., Gd_{64}^{577},$$

$$Tb_{65}^{130} \to N_l^I = 65, \quad N_{\bar{\nu}_l}^I = 520 \to N_{full}^I = 585 \to Tb_{65}^{65}, ..., Tb_{65}^{586},$$

$$Dy_{66}^{132} \to N_l^I = 66, \quad N_{\bar{\nu}_l}^I = 528 \to N_{full}^I = 594 \to Dy_{66}^{66}, ..., Dy_{66}^{595},$$

$$Ho_{67}^{134} \to N_l^I = 67, \quad N_{\bar{\nu}_l}^I = 536 \to N_{full}^I = 603 \to Ho_{67}^{67}, ..., Ho_{67}^{604},$$

$$Er_{68}^{136} \to N_l^I = 68, \quad N_{\bar{\nu}_l}^I = 544 \to N_{full}^I = 612 \to Er_{68}^{68}, ..., Er_{68}^{613},$$

$$Tu_{69}^{138} \to N_l^I = 69, \quad N_{\bar{\nu}_l}^I = 552 \to N_{full}^I = 621 \to Tu_{69}^{69}, ..., Tu_{69}^{622},$$

$$Yb_{70}^{140} \to N_l^I = 70, \quad N_{\bar{\nu}_l}^I = 560 \to N_{full}^I = 630 \to Yb_{70}^{70}, ..., Yb_{70}^{631},$$

$$Lu_{71}^{142} \to N_l^I = 71, \quad N_{\bar{\nu}_l}^I = 568 \to N_{full}^I = 639 \to Lu_{71}^{71}, ..., Lu_{71}^{640}.$$

Such a succession takes place even at an atomic unification

$$Hf_{72}^{144} \to N_l^I = 72, \quad N_{\bar{\nu}_l}^I = 576 \to N_{full}^I = 648 \to Hf_{72}^{72}, ..., Hf_{72}^{649},$$

$$Tu_{73}^{146} \to N_l^I = 73, \quad N_{\bar{\nu}_l}^I = 584 \to N_{full}^I = 657 \to Tu_{73}^{73}, ..., Tu_{73}^{658},$$

$$W_{74}^{148} \to N_l^I = 74, \quad N_{\bar{\nu}_l}^I = 592 \to N_{full}^I = 666 \to W_{74}^{74}, ..., W_{74}^{667},$$

$$Re_{75}^{150} \to N_l^I = 75, \quad N_{\bar{\nu}_l}^I = 600 \to N_{full}^I = 675 \to Re_{75}^{75}, ..., Re_{75}^{676},$$

$$Os_{76}^{152} \to N_l^I = 76, \quad N_{\bar{\nu}_l}^I = 608 \to N_{full}^I = 684 \to Os_{76}^{76}, ..., Os_{76}^{685},$$

$$Ir_{77}^{154} \to N_l^I = 77, \quad N_{\bar{\nu}_l}^I = 616 \to N_{full}^I = 693 \to Ir_{77}^{77}, ..., Ir_{77}^{694},$$

$$Pt_{78}^{156} \to N_l^I = 78, \quad N_{\bar{\nu}_l}^I = 624 \to N_{full}^I = 702 \to Pt_{78}^{78}, ..., Pt_{78}^{703},$$

$$Au_{79}^{158} \to N_l^I = 79, \quad N_{\bar{\nu}_l}^I = 632 \to N_{full}^I = 711 \to Au_{79}^{79}, ..., Au_{79}^{712},$$

$$Hg_{80}^{160} \to N_l^I = 80, \quad N_{\bar{\nu}_l}^I = 640 \to N_{full}^I = 720 \to Hg_{80}^{80}, ..., Hg_{80}^{721},$$

$$Tl_{81}^{162} \to N_l^I = 81, \quad N_{\bar{\nu}_l}^I = 648 \to N_{full}^I = 729 \to Tl_{81}^{81}, ..., Tl_{81}^{730},$$

$$Pb_{82}^{164} \to N_l^I = 82, \quad N_{\bar{\nu}_l}^I = 656 \to N_{full}^I = 738 \to Pb_{82}^{82}, ..., Pb_{82}^{739},$$

$$Bi_{83}^{166} \to N_l^I = 83, \quad N_{\bar{\nu}_l}^I = 664 \to N_{full}^I = 747 \to Bi_{83}^{83}, ..., Bi_{83}^{748},$$

$$Po_{84}^{168} \to N_l^I = 84, \quad N_{\bar{\nu}_l}^I = 672 \to N_{full}^I = 756 \to Po_{84}^{84}, ..., Po_{84}^{757},$$

$$At^{170}_{85} \to N^I_l = 85, \quad N^I_{\bar{\nu}_l} = 680 \to N^I_{full} = 765 \to At^{85}_{85}, ..., At^{766}_{85},$$

$$Rn^{172}_{86} \to N^I_l = 86, \quad N^I_{\bar{\nu}_l} = 688 \to N^I_{full} = 774 \to Rn^{86}_{86}, ..., Rn^{775}_{86},$$

$$Fr^{174}_{87} \to N^I_l = 87, \quad N^I_{\bar{\nu}_l} = 696 \to N^I_{full} = 783 \to Fr^{87}_{87}, ..., Fr^{784}_{87},$$

$$Ra^{176}_{88} \to N^I_l = 88, \quad N^I_{\bar{\nu}_l} = 704 \to N^I_{full} = 792 \to Ra^{88}_{88}, ..., Ra^{793}_{88},$$

$$Ac^{178}_{89} \to N^I_l = 89, \quad N^I_{\bar{\nu}_l} = 712 \to N^I_{full} = 801 \to Ac^{89}_{89}, ..., Ac^{802}_{89}.$$

They require for completeness to present here the quantity of isotopes in the most heavy forms of atomic roots

$$Th^{180}_{90} \to N^I_l = 90, \quad N^I_{\bar{\nu}_l} = 720 \to N^I_{full} = 810 \to Th^{90}_{90}, ..., Th^{811}_{90},$$

$$Pa^{182}_{91} \to N^I_l = 91, \quad N^I_{\bar{\nu}_l} = 728 \to N^I_{full} = 819 \to Pa^{91}_{91}, ..., Pa^{820}_{91},$$

$$U^{184}_{92} \to N^I_l = 92, \quad N^I_{\bar{\nu}_l} = 736 \to N^I_{full} = 828 \to U^{92}_{92}, ..., U^{829}_{92},$$

$$Np^{186}_{93} \to N^I_l = 93, \quad N^I_{\bar{\nu}_l} = 744 \to N^I_{full} = 837 \to Np^{93}_{93}, ..., Np^{838}_{93},$$

$$Pu^{188}_{94} \to N^I_l = 94, \quad N^I_{\bar{\nu}_l} = 752 \to N^I_{full} = 846 \to Pu^{94}_{94}, ..., Pu^{847}_{94},$$

$$Am^{190}_{95} \to N^I_l = 95, \quad N^I_{\bar{\nu}_l} = 760 \to N^I_{full} = 855 \to Am^{95}_{95}, ..., Am^{856}_{95},$$

$$Cm^{192}_{96} \to N^I_l = 96, \quad N^I_{\bar{\nu}_l} = 768 \to N^I_{full} = 864 \to Cm^{96}_{96}, ..., Cm^{865}_{96},$$

$$Bk^{194}_{97} \to N^I_l = 97, \quad N^I_{\bar{\nu}_l} = 776 \to N^I_{full} = 873 \to Bk^{97}_{97}, ..., Bk^{874}_{97},$$

$$Cf^{196}_{98} \to N^I_l = 98, \quad N^I_{\bar{\nu}_l} = 784 \to N^I_{full} = 882 \to Cf^{98}_{98}, ..., Cf^{883}_{98},$$

$$Es^{198}_{99} \to N^I_l = 99, \quad N^I_{\bar{\nu}_l} = 792 \to N^I_{full} = 891 \to Es^{99}_{99}, ..., Es^{892}_{99},$$

$$Fm^{200}_{100} \to N^I_l = 100, \quad N^I_{\bar{\nu}_l} = 800 \to N^I_{full} = 900 \to Fm^{100}_{100}, ..., Fm^{901}_{100},$$

$$Md^{202}_{101} \to N^I_l = 101, \quad N^I_{\bar{\nu}_l} = 808 \to N^I_{full} = 909 \to Md^{101}_{101}, ..., Md^{910}_{101},$$

$$No^{204}_{102} \to N^I_l = 102, \quad N^I_{\bar{\nu}_l} = 816 \to N^I_{full} = 918 \to No^{102}_{102}, ..., No^{919}_{102},$$

$$Lr^{206}_{103} \to N^I_l = 103, \quad N^I_{\bar{\nu}_l} = 824 \to N^I_{full} = 927 \to Lr^{103}_{103}, ..., Lr^{928}_{103}.$$

It is seen that a succession of full sizes of isotopes

$$9, \quad 18, \quad 27, \quad ..., \quad 927, \quad ... \tag{95}$$

constitutes the arithmetical progression corresponding in a system of roots of atoms to a kind of succession of atomic numbers

$$1, \quad 2, \quad 3, ..., \quad 103, \quad .... \tag{96}$$

Of course, the sum of the first 103 terms does not exclude, in the case of (95), the availability in nature of 48204 forms of isotopes of 103 types of atoms. But of them only 3000 forms are of a set of the discovered atomic isotopes of a latent structure [26,27].

## 7. Atoms in external fields

There exists a range of the structural connections in which appears a part of the family structure of atoms. A bright example is an uncovered by Stark [5] of the fact of spectral line splittings of hydrogen and helium in an electric field.

To solve the question of why an electric field splits each spectral line of atomic system into a range of other lines, between which there exists a regular succession, one must apply to the quanta of this field, namely, to the photons of an electric nature, because they act on its structure. However, unlike earlier known, the influence of their field on an atom is carried out in Stark experiences as an indication in favor of hard connections of an atomic system and a photon medium.

At the same time, the interratio itself of these two types of objects corresponds in the field of emission to the coexistence of photobirths of both neutrino and neutron pairs. Therefore, from its point of view, it should be expected that each of photosplittings

$$\gamma_R \to \nu_{\epsilon R} + \bar{\nu}_{\epsilon R}, \quad \overline{\gamma}_L \to \nu_{\epsilon L} + \bar{\nu}_{\epsilon L} \tag{97}$$

says about the dynamical origination in another place of the same electric field of a kind of photosplitting of

$$\gamma_R \to n_R^- + n_R^+, \quad \overline{\gamma}_L \to n_L^- + n_L^+. \tag{98}$$

These transitions together with summed baryon and lepton number conservation transform the photon field into an atomic one. Its quanta (53), namely, the neutrino hydrogens of Al-Fargoniy $Fn_1^1$ and $\bar{F}n_1^1$ have important consequences for unification of atoms.

A set of transitions

$$Fn_1^1 + X_Z^{2Z} \to X_Z^{2Z+1}, \tag{99}$$

$$\bar{F}n_1^1 + X_Z^{Z+1} \to X_Z^Z \tag{100}$$

originating in an atomic field constitutes herewith an isotopic family of the investigated atom that was identified by Stark as a splitting of its spectral lines.

Insofar as a completeness of the observed picture is concerned, it can appear in the power dependence of devices used for its discovery. However, the density of lines at the replacement of hydrogen by helium, as established in Stark [5] experiences, suffers a structural change. This well known fact explains why the implications implied from (92), (99) and (100) confirm the existence of a unified spectral structure of atoms.

A splitting of spectral lines of atomic system is also observed in an external magnetic field. But, as was discovered by Zeeman [6] for the first time, it is not an usual intraatomic transition.

At first sight, a magnetic field acts on atoms by the same mechanism, which responsible for influence of an electric field on their structure. This, however, would take place only in the case of the fundamental symmetry between the electricity and the magnetism being wholly absent. Therefore, without violate of the structural regularities of electromagnetic matter fields, we accept its ideas about that each particle with electric mass and charge says in favor [28] of a kind of monoparticle with magnetic mass and charge. In a given situation, any monophoton may serve as one of quanta of a magnetic field.

The unity of symmetry laws of elementary monoparticles splits one monophoton state into the mononeutrino pairs. Another monophoton state of the same magnetic field is splited into the mononeutron pairs. Thereby, it transforms the monophoton field into a monoatomic one so that the quanta of a given field, namely, the monohydrogens of Al-Fargoniy $Fn_1^1$ and $\bar{F}n_1^1$ relate one pair of mononeutrinos with another pair of mononeutrons as a consequence of a grand synthesis of mononuclei.

If an atom now interacts with a magnetic field, it can be converted at first into a monoatom and, next, the latter at the new level encounters quanta of this field.

A set of collisions carrying out in a monoatomic field constitutes at these circumstances the monoisotopic family that was identified by Zeeman as a splitting of spectral lines of an atom in a magnetic field.

From these remarks, it is clear that the difference in lifetimes of isotopes comes forward in both experiences as a criterion for completeness of a spectral picture.

## 8. Orbital mass, charge and completeness of a quantum nature of atoms

Turning again to (7), we remark that nature itself of atomic system requires one at the quantum mechanical level to follow the logic of each component of an intraatomic united force from the point of view of the interacting objects of an orbital behavior. It chooses herewith the sizes of Newton and Coulomb forces between the nucleus and its satellite so that in a latent united form their explicit values were equal to

$$F_{N_{sl}} = G_N \frac{m_s m_l}{r_{ls}^2}, \quad F_{C_{sl}} = \frac{1}{4\pi\epsilon_0} \frac{e_s e_l}{r_{ls}^2}. \tag{101}$$

Here $l = \epsilon$, $e$, $\mu$, $\tau$ or $\nu_l$, $s$ denotes the atomic nucleus.

If we use the Planck mass and charge

$$m_{pl} = \left(\frac{\hbar c}{G_N}\right)^{1/2}, \quad e_{pl} = (4\pi\epsilon_0 \hbar c)^{1/2}, \tag{102}$$

at which (101) are reduced to

$$F_{N_{sl}} = \frac{\hbar c}{m_{pl}^2} \frac{m_s m_l}{r_{ls}^2}, \quad F_{C_{sl}} = \frac{\hbar c}{e_{pl}^2} \frac{e_s e_l}{r_{ls}^2}, \tag{103}$$

for $F_{C_{sl}} > F_{N_{sl}}$ when

$$c_m^{sl} = \frac{F_{C_{sl}}}{F_{N_{sl}}} \tag{104}$$

is, in a latent classical dynamics, a relation among the parameters

$$c_m^{sl} = \frac{e_s e_l}{e_{pl}^2} \frac{m_{pl}^2}{m_s m_l}, \tag{105}$$

one can relate on the disclosed quantum basis the intraatomic forces

$$F_{N_{sl}} = \frac{\hbar c}{m_{pl}^2} \left(\frac{m_{sl}^o}{r_{ls}}\right)^2, \quad F_{C_{sl}} = \frac{\hbar c}{e_{pl}^2} \left(\frac{e_{sl}^o}{r_{ls}}\right)^2 \tag{106}$$

and the relation

$$c_m^{sl} = \left(\frac{e_{sl}^o}{e_{pl}}\right)^2 \left(\frac{m_{pl}}{m_{sl}^o}\right)^2 \tag{107}$$

to orbital mass and charge

$$m_{sl}^o = (b_m^{sl} m_s m_l)^{1/2}, \quad e_{sl}^o = (b_{ch}^{sl} e_s e_l)^{1/2}. \tag{108}$$

The availability in them of dimensionless multipliers $b_m^{sl}$ and $b_{ch}^{sl}$ implies the existence in a system of any of sizes $m_{sl}^o$ and $e_{sl}^o$ at the quantum mechanical level. They define herewith the speed $v_{ls}$, radius $r_{ls}$, full orbital energy $E_{ls}$, and thus directly the rotation period $T_{ls}$ of a particle $l$ around the nucleus $s$ in the nature dependence of the structural components of an intraatomic unified force.

Therefore, if the interaction between $l$ and $s$ is carried out in atoms as a consequence of Newton forces, the legality of conservation of an angular momentum for the atomic orbits quantized by leptonic flavors follows from the fact that

$$b_{mn}^{sl} m_l v_{ls}^N r_{ls}^N = k_{sl}^N \hbar, \tag{109}$$

where $b_{mn}^{sl}$ characterizes the orbital mass responsible for construction of an atom in the presence of a force of gravity of the Newton, and $k_{sl}^N$ describes the quantized succession of its orbit with radii $r_{ls}^N$ and speeds $v_{ls}^N$ of their particles.

To investigate further, one must follow the logic of the third law of the Kepler, because it expresses in whole the idea about that

$$\frac{(r_{ls}^N)^2}{T_{ls}^N} \frac{r_{ls}^N}{T_{ls}^N} = \frac{G_N m_s}{4\pi^2}. \tag{110}$$

Unification of (110) with a relation

$$\frac{(r_{ls}^N)^2}{T_{ls}^N} = \frac{k_{sl}^N \hbar}{2\pi m_l} \tag{111}$$

implied from (109) and

$$T_{ls}^N = \frac{2\pi r_{ls}^N}{v_{ls}^N}, \tag{112}$$

suggests a connection

$$\frac{r_{ls}^N}{T_{ls}^N} = G_N \frac{b_{mn}^{sl} m_s m_l}{2\pi k_{sl}^N \hbar}, \tag{113}$$

and consequently, insertion of (113) in

$$\frac{r_{ls}^N}{T_{ls}^N} = \frac{v_{ls}^N}{2\pi} \tag{114}$$

at the use of (102), (108) and (109) allows to conclude that

$$v_{ls}^N = \frac{1}{k_{sl}^N} \left( \frac{m_{sl}^o}{m_{pl}} \right)^2 c, \tag{115}$$

$$r_{ls}^N = (k_{sl}^N)^2 \left( \frac{m_{pl}}{m_{sl}^o} \right)^2 \frac{\hbar}{b_{mn}^{sl} m_l c}. \tag{116}$$

Insofar as a full orbital energy is concerned, it consists of kinetic and potential parts corresponding in nature to the most diverse properties of the same particle. But unlike the classical presentations on the orbital motions, the discussed theory of an atomic structure relates the Newton energy $E_{ls}^N$ to mass $m_{sl}^o$ and radius $r_{ls}^N$, confirming that

$$E_{ls}^N = -\frac{1}{2} \left( \frac{m_{sl}^o}{m_{pl}} \right)^2 \frac{\hbar c}{r_{ls}^N}. \tag{117}$$

In its definition an important circumstance is the connection

$$E_{ls}^{N}=\frac{1}{2}b_{mn}^{sl}m_{l}(v_{ls}^{N})^{2}-G_{N}\frac{b_{mn}^{sl}m_{s}m_{l}}{r_{ls}^{N}} \tag{118}$$

in which

$$(v_{ls}^{N})^{2}r_{ls}^{N}=G_{N}m_{s}. \tag{119}$$

There exists, however, the possibility that at the availability of a Coulomb force between $l$ and $s$, a quantized succession $k_{sl}^{C}$ of atomic orbits of radii $r_{ls}^{C}$ and speeds $v_{ls}^{C}$ is responsible for conservation of an angular momentum

$$b_{mc}^{sl}m_{l}v_{ls}^{C}r_{ls}^{C}=k_{sl}^{C}\hbar \tag{120}$$

including the dimensionless size $b_{mc}^{sl}$ of an orbital mass arising at its Coulomb construction. Thereby, it predicts on the quantum mechanical basis one more another disclosed equation

$$b_{mc}^{sl}\frac{m_{l}(v_{ls}^{C})^{2}}{r_{ls}^{C}}-\frac{1}{4\pi\epsilon_{0}}\frac{b_{ch}^{sl}e_{s}e_{l}}{(r_{ls}^{C})^{2}}=0. \tag{121}$$

Uniting (121) with (120) having in mind (102) and (108), one can find that

$$v_{ls}^{C}=\frac{1}{k_{sl}^{C}}\left(\frac{e_{sl}^{o}}{e_{pl}}\right)^{2}c, \tag{122}$$

$$r_{ls}^{C}=(k_{sl}^{C})^{2}\left(\frac{e_{pl}}{e_{sl}^{o}}\right)^{2}\frac{\hbar}{b_{mc}^{sl}m_{l}c}. \tag{123}$$

Simultaneously, as is easy to see, the Coulomb orbital energy equal to

$$E_{ls}^{C}=-\frac{1}{2}\left(\frac{e_{sl}^{o}}{e_{pl}}\right)^{2}\frac{\hbar c}{r_{ls}^{C}} \tag{124}$$

is a consequence of unification of (102), (108) and (121) with

$$E_{ls}^{C}=\frac{1}{2}b_{mc}^{sl}m_{l}(v_{ls}^{C})^{2}-\frac{1}{4\pi\epsilon_{0}}\frac{b_{ch}^{sl}e_{s}e_{l}}{r_{ls}^{C}} \tag{125}$$

that unites its kinetic and potential components.

However, to build the functions $v_{ls}$, $r_{ls}$, $T_{ls}$ and $E_{ls}$, one must establish a true picture of the structural sizes $b_{m}^{sl}$, $b_{ch}^{sl}$ and $k_{sl}$ by the intraatomic symmetry laws studying on its basis the interratio of each pair of the corresponding types of atomic systems.

## 9. Atoms with nuclei from neutrons or antiprotons

Between the atomic systems $Fn_{N}^{N}(\bar{F}n_{N}^{N})$ and $\bar{X}_{Z}^{Z}(X_{Z}^{Z})$ there exist those connections, because of which in the Newton case at the single neutron (antineutron) and antiproton (proton), from (115), (116) and (119), we are led to the following interrelationship of orbital masses of the two types of atoms with the antineutrino (neutrino) and antilepton (lepton) orbits:

$$\left(\frac{m_{n\bar{\nu}_{l}}^{o}}{m_{pl}}\right)^{2}\frac{m_{p}}{b_{mn}^{n\bar{\nu}_{l}}m_{\bar{\nu}_{l}}}=\left(\frac{m_{pl}^{o}}{m_{pl}}\right)^{2}\frac{m_{n}}{b_{mn}^{pl}m_{l}}. \tag{126}$$

Here $m^o_{n\bar{\nu}_l}(m^o_{pl})$ implies the orbital mass of an atomic system, in a nucleus of which antiproton (neutron) is absent, and $b^{n\bar{\nu}_l}_{mn}(b^{pl}_{mn})$ denotes its dimensionless size.

At first sight, the same equation (126), by itself, does not define the structure of orbital masses of atoms of both types. This, however, does not exclude that the functions $(m^o_{n\bar{\nu}_l}/m_{pl})^2$ and $(m^o_{pl}/m_{pl})^2$ are connected with some individual variables. Such variables can, for example, be of those structural sizes, at which flavor symmetry of an equation (126) establishes an equality following from its baryon symmetry. We can, therefore, conclude that

$$\left(\frac{m^o_{\bar{n}\nu_l}}{m_{pl}}\right)^2 = \frac{m_p}{b^{n\bar{\nu}_l}_{mn} m_{\bar{\nu}_l}}, \quad b^{n\bar{\nu}_l}_{mn} = \frac{m_{pl}}{m_{\bar{\nu}_l}}\sqrt{\frac{m_p}{m_n}}, \tag{127}$$

$$\left(\frac{m^o_{pl}}{m_{pl}}\right)^2 = \frac{m_n}{b^{pl}_{mn} m_l}, \quad b^{pl}_{mn} = \frac{m_{pl}}{m_l}\sqrt{\frac{m_n}{m_p}}. \tag{128}$$

In their presence, the baryon symmetry of an equation (126) states that

$$m_n m_p = m_n m_p. \tag{129}$$

Inserting (127) and (128) in (115) at $s = p(n)$, $l = l(\bar{\nu}_l)$ and taking into account that $v^N_{\bar{\nu}_l n} \neq v^N_{lp}$, we are led to the fact that

$$\frac{1}{k^N_{n\bar{\nu}_l}} \frac{m_p}{b^{n\bar{\nu}_l}_{mn} m_{\bar{\nu}_l}} \neq \frac{1}{k^N_{pl}} \frac{m_n}{b^{pl}_{mn} m_l}. \tag{130}$$

From the point of view of each atomic system of $n\bar{\nu}_l$ and $pl$, an inequality (130) must have the flavor as well as the baryon symmetry. At their conservation, it should be chosen $(1/k^N_{n\bar{\nu}_l})$ and $(1/k^N_{pl})$ so that the baryon symmetry constitutes, in the case of (130), an inequality implied from its flavor symmetry. Such connections describe a situation when the two equalities become solutions of the same inequality analogously to the fact that an equality (110) expressing the idea of the third law of the Kepler [29-32] holds for all inequalities between the planets of solar system. This comes forward in atoms $n\bar{\nu}_l$ and $pl$ as a criterion for an orbit quantized succession

$$k^N_{n\bar{\nu}_l} = \frac{m_n}{m_{\bar{\nu}_l}}, \quad k^N_{pl} = \frac{m_p}{m_l}. \tag{131}$$

Therefore, uniting (131) with (130), one can find again that

$$m_p m_{\bar{\nu}_l} \neq m_n m_l. \tag{132}$$

An equation (127) and fitst of (131) together with (115)-(117) at $s = n(l = \bar{\nu}_l)$ allows to establish four of intraatomic Newton connections

$$v^N_{\bar{\nu}_l n} = \frac{m_{\bar{\nu}_l}}{m_{pl}}\sqrt{\frac{m_p}{m_n}}c, \tag{133}$$

$$r^N_{\bar{\nu}_l n} = \left(\frac{m_n}{m_{\bar{\nu}_l}}\right)^2 \frac{\hbar}{m_p c}, \tag{134}$$

$$E^N_{\bar{\nu}_l n} = -\frac{1}{2}\frac{m_{\bar{\nu}_l}}{m_{pl}}\left(\frac{m_p}{m_n}\right)^{3/2} E^N_{\bar{\nu}_l}, \tag{135}$$

$$E^N_{\bar{\nu}_l} = m_{\bar{\nu}_l} c^2. \tag{136}$$

Comparing (128) and second of (131) with (115)-(117) having in view an atom $s = p(l = l)$, one can also make a conclusion that

$$v_{lp}^N = \frac{m_l}{m_{pl}}\sqrt{\frac{m_n}{m_p}}c, \tag{137}$$

$$r_{lp}^N = \left(\frac{m_p}{m_l}\right)^2 \frac{\hbar}{m_n c}, \tag{138}$$

$$E_{lp}^N = -\frac{1}{2}\frac{m_l}{m_{pl}}\left(\frac{m_n}{m_p}\right)^{3/2} E_l^N, \tag{139}$$

$$E_l^N = m_l c^2. \tag{140}$$

Another possibility is that insertion of (127) and (128) in a relation (107) at $s = p(n)$ and $l = l(\bar{\nu}_l)$ transforms $c_m^{n\bar{\nu}_l} \neq c_m^{pl}$ into an inequality

$$\left(\frac{e_{n\bar{\nu}_l}^o}{e_{pl}}\right)^2 \frac{b_{mn}^{n\bar{\nu}_l} m_{\bar{\nu}_l}}{m_p} \neq \left(\frac{e_{pl}^o}{e_{pl}}\right)^2 \frac{b_{mn}^{pl} m_l}{m_n}, \tag{141}$$

where $e_{n\bar{\nu}_l}^o (e_{pl}^o)$ characterizes the orbital charge of an atom with a nucleus from neutrons (protons) including its dimensionless size.

For elucidation of their ideas, it is desirable to relate on the basis of flavor and baryon symmetries the functions $(e_{n\bar{\nu}_l}^o/e_{pl})^2$ and $(e_{pl}^o/e_{pl})^2$ to individual variables

$$\left(\frac{e_{n\bar{\nu}_l}^o}{e_{pl}}\right)^2 = \frac{m_n}{b_{mn}^{n\bar{\nu}_l} m_{\bar{\nu}_l}}, \quad b_{ch}^{n\bar{\nu}_l} = \frac{m_n}{b_{mn}^{n\bar{\nu}_l} m_{\bar{\nu}_l}} \frac{e_{pl}^2}{e_n e_{\bar{\nu}_l}}, \tag{142}$$

$$\left(\frac{e_{pl}^o}{e_{pl}}\right)^2 = \frac{m_p}{b_{mn}^{pl} m_l}, \quad b_{ch}^{pl} = \frac{m_p}{b_{mn}^{pl} m_l} \frac{e_{pl}^2}{e_p e_l}. \tag{143}$$

These variables together with (127) and (128) predict the two explicit values of a relation (107) in the atomic nucleus type dependence

$$c_m^{n\bar{\nu}_l} = \frac{m_n}{m_p}, \quad c_m^{pl} = \frac{m_p}{m_n}. \tag{144}$$

Their structure herewith leads us once more to

$$m_n^2 \neq m_p^2, \tag{145}$$

confirming that an equality (122) expresses, in the case of the Coulomb force between $l$ and $s$, the ideas of an inequality $v_{\bar{\nu}_l n}^C \neq v_{lp}^C$ as the following unidenticality:

$$\frac{1}{k_{n\bar{\nu}_l}^C} \frac{m_n}{b_{mn}^{n\bar{\nu}_l} m_{\bar{\nu}_l}} \neq \frac{1}{k_{pl}^C} \frac{m_p}{b_{mn}^{pl} m_l}. \tag{146}$$

At the same time, the difference itself in speeds $v_{\bar{\nu}_l n}$ and $v_{lp}$ is a general and does not depend on whether the intraatomic forces have a Newton or a Coulomb nature. Therefore, without contradicting flavor and baryon symmetry laws, the functions such as $(1/k_{n\bar{\nu}_l})$ and $(1/k_{pl})$ replace (130) and (146) by the same inequality (132) arising from (146) in the cases when

$$k_{n\bar{\nu}_l}^C = \frac{m_{\bar{\nu}_l}}{m_p}, \quad k_{pl}^C = \frac{m_l}{m_n}. \tag{147}$$

It is not excluded, however, that

$$k_{n\bar{\nu}_l}^C = c_k^{n\bar{\nu}_l} k_{n\bar{\nu}_l}^N, \quad k_{pl}^C = c_k^{pl} k_{pl}^N, \tag{148}$$

$$c_k^{n\bar{\nu}_l} = \frac{m_{\bar{\nu}_l}^2}{m_p m_n}, \quad c_k^{pl} = \frac{m_l^2}{m_p m_n}. \tag{149}$$

Uniting (142) and first of (144), (147) and

$$b_{mc}^{n\bar{\nu}_l} = c_m^{n\bar{\nu}_l} b_{mn}^{n\bar{\nu}_l}, \quad b_{mc}^{pl} = c_m^{pl} b_{mn}^{pl} \tag{150}$$

with (122)-(124) at $s = n(l = \bar{\nu}_l)$, we find four of intraatomic Coulomb connections

$$v_{\bar{\nu}_l n}^C = \frac{m_n}{m_{\bar{\nu}_l}} \sqrt{\frac{m_p m_n}{m_{pl}^2}} c, \tag{151}$$

$$r_{\bar{\nu}_l n}^C = \left( \frac{m_{\bar{\nu}_l}}{m_n} \right)^2 \frac{\hbar}{m_p c}, \tag{152}$$

$$E_{\bar{\nu}_l n}^C = -\frac{1}{2} \left( \frac{m_n}{m_{\bar{\nu}_l}} \right)^2 \sqrt{\frac{m_p m_n}{m_{pl}^2}} E_n^C, \tag{153}$$

$$E_n^C = m_n c^2. \tag{154}$$

Accepting in (122)-(124) an atomic system $s = p(l = l)$ using (143) and second of (144), (147) and (150), we are led to the equalities

$$v_{lp}^C = \frac{m_p}{m_l} \sqrt{\frac{m_p m_n}{m_{pl}^2}} c, \tag{155}$$

$$r_{lp}^C = \left( \frac{m_l}{m_p} \right)^2 \frac{\hbar}{m_n c}, \tag{156}$$

$$E_{lp}^C = -\frac{1}{2} \left( \frac{m_p}{m_l} \right)^2 \sqrt{\frac{m_p m_n}{m_{pl}^2}} E_p^C, \tag{157}$$

$$E_p^C = m_p c^2. \tag{158}$$

Comparison of (151) and (155) with (133) and (137) says about that

$$v_{\bar{\nu}_l n}^C = c_v^{n\bar{\nu}_l} v_{\bar{\nu}_l n}^N, \quad v_{lp}^C = c_v^{pl} v_{lp}^N, \tag{159}$$

$$c_v^{n\bar{\nu}_l} = \left( \frac{m_n}{m_{\bar{\nu}_l}} \right)^2, \quad c_v^{pl} = \left( \frac{m_p}{m_l} \right)^2. \tag{160}$$

If we for definiteness consider the structural functions (134), (138), (152) and (156), it is easy to observe the differences

$$r_{\bar{\nu}_l n}^C = c_r^{n\bar{\nu}_l} r_{\bar{\nu}_l n}^N, \quad r_{lp}^C = c_r^{pl} r_{lp}^N, \tag{161}$$

$$c_r^{n\bar{\nu}_l} = \left( \frac{m_{\bar{\nu}_l}}{m_n} \right)^4, \quad c_r^{pl} = \left( \frac{m_l}{m_p} \right)^4, \tag{162}$$

which show that (151), (152), (155) and (156) become defined owing to a relation (107) expressing the ideas of Planck mass and charge. Therefore, to uncover (115), (116) and to use their contributions at the quantitative analysis of atomic systems, one must elucidate the nature of a Planck particle responsible for harmony of the Coulomb and Newton types of forces.

Thus, we can expect from the nature itself of an atom that $v_{ls}^N$, $r_{ls}^N$ and $E_{ls}^N$ must be compatible with $v_{ls}^C$, $r_{ls}^C$, $E_{ls}^C$ and that, consequently, $v_{ls}$, $r_{ls}$ and $E_{ls}$ are equal to

$$v_{ls} = v_{ls}^N + v_{ls}^C, \tag{163}$$

$$r_{ls} = r_{ls}^N + r_{ls}^C, \tag{164}$$

$$E_{ls} = E_{ls}^N + E_{ls}^C. \tag{165}$$

But here we will use only the same contributions, namely

$$v_{ls} = v_{ls}^C, \quad r_{ls} = r_{ls}^C, \quad E_{ls} = E_{ls}^C. \tag{166}$$

This does not exclude simultaneously that

$$m_l = m_l^E + m_l^W, \quad m_s = m_s^E + m_s^W, \tag{167}$$

$$e_l = e_l^E + e_l^W, \quad e_s = e_s^E + e_s^W. \tag{168}$$

At the choice of a number of neutrons $N_n$ and antineutrinos $N_{\bar{\nu}_l}$, equations (151)-(153) generalize (166) to the case of all types of atoms with nuclei not having antiprotons. This gives the right to define on their basis the functions $v_{\bar{\nu}_l n}$, $r_{\bar{\nu}_l n}$, $T_{\bar{\nu}_l n}$ and $E_{\bar{\nu}_l n}$ in a general form by the following manner:

$$v_{\bar{\nu}_l n} = \frac{m_n}{m_{\bar{\nu}_l}} \left(\frac{N_n}{N_{\bar{\nu}_l}}\right) \sqrt{\frac{N_p N_n m_p m_n}{m_{pl}^2}} c, \tag{169}$$

$$r_{\bar{\nu}_l n} = \left(\frac{m_{\bar{\nu}_l}}{m_n}\right)^2 \left(\frac{N_{\bar{\nu}_l}}{N_n}\right)^2 \frac{\hbar}{N_p m_p c}, \tag{170}$$

$$T_{\bar{\nu}_l n} = \frac{2\pi}{c} \left(\frac{m_{\bar{\nu}_l}}{m_n}\right)^3 \left(\frac{N_{\bar{\nu}_l}}{N_n}\right)^3 \sqrt{\frac{m_{pl}^2}{N_p N_n m_p m_n}} \frac{\hbar}{N_p m_p c}, \tag{171}$$

$$E_{\bar{\nu}_l n} = -\frac{1}{2} \left(\frac{m_n}{m_{\bar{\nu}_l}}\right)^2 \left(\frac{N_n}{N_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{N_p^3 N_n^3 m_p m_n}{m_{pl}^2}} E_n, \tag{172}$$

$$E_n = m_n c^2. \tag{173}$$

In the presence of a number of antiprotons $N_p$ and leptons $N_l$, the compound structure of (155)-(157) expresses the ideas of all atoms with nuclei without neutrons. These ideas transform $v_{lp}$, $r_{lp}$, $T_{lp}$ and $E_{lp}$ from (166) into

$$v_{lp} = \frac{m_p}{m_l} \left(\frac{N_p}{N_l}\right) \sqrt{\frac{N_p N_n m_p m_n}{m_{pl}^2}} c, \tag{174}$$

$$r_{lp} = \left(\frac{m_l}{m_p}\right)^2 \left(\frac{N_l}{N_p}\right)^2 \frac{\hbar}{N_n m_n c}, \tag{175}$$

$$T_{lp} = \frac{2\pi}{c} \left(\frac{m_l}{m_p}\right)^3 \left(\frac{N_l}{N_p}\right)^3 \sqrt{\frac{m_{pl}^2}{N_p N_n m_p m_n}} \frac{\hbar}{N_n m_n c}, \tag{176}$$

$$E_{lp} = -\frac{1}{2}\left(\frac{m_p}{m_l}\right)^2 \left(\frac{N_p}{N_l}\right)^2 \sqrt{\frac{N_p^3 N_n^3 m_p m_n}{m_{pl}^2}} E_p, \tag{177}$$

$$E_p = m_p c^2. \tag{178}$$

For quantitative analysis of atomic systems, it is desirable to use an uranium family, the root of a stem of which may symbolically be presented as

$$Fn_{92}^{92} + U_{92}^{92} \to U_{92}^{184}, \tag{179}$$

where $Fn_{92}^{92}$ must be accepted as an atom of Al-Fargoniy from the uranium family. Its orbital structure has the form

$$Fn_{92}^{92} \to O_{\bar{\nu}_\epsilon}^L,\;\; O_{\bar{\nu}_\epsilon}^R,\;\; O_{\bar{\nu}_e}^L,\;\; O_{\bar{\nu}_e}^R,\;\; O_{\bar{\nu}_\mu}^L,\;\; O_{\bar{\nu}_\mu}^R,\;\; O_{\bar{\nu}_\tau}^L,\;\; O_{\bar{\nu}_\tau}^R \to N_{\bar{\nu}_\epsilon}^o = 1,2,\;\; N_{\bar{\nu}_e}^o = 3,4,$$

$$N_{\bar{\nu}_\mu}^o = 5,6,\;\; N_{\bar{\nu}_\tau}^o = 7,8 \to N_{\bar{\nu}_\epsilon} = 13,13,\;\; N_{\bar{\nu}_e} = 12,12,\;\; N_{\bar{\nu}_\mu} = 11,11,\;\; N_{\bar{\nu}_\tau} = 10,10.$$

The antineutrino orbits with the even orders $N_{\bar{\nu}_l}^o = 2,4,6,8$ consist of the right-handed particles. But the question about restrictions on their masses still remains open.

Therefore, at a given stage we will start from the fact that (19), (40), (41), (43) and (44) can be recognized as the masses of the left-handed fermions. In this case, (169) for the speeds of antineutrinos in orbit of an odd ($N_{\bar{\nu}_l}^o = 1,3,5,7$) order leads to

$$v_{\bar{\nu}_\epsilon n} < 9.7198227 \cdot 10^4 \text{ m/s},$$

$$v_{\bar{\nu}_e n} < 6.1115698 \text{ m/s},$$

$$v_{\bar{\nu}_\mu n} < 9.8046575 \cdot 10^{-5} \text{ m/s},$$

$$v_{\bar{\nu}_\tau n} < 1.0074016 \cdot 10^{-6} \text{ m/s}.$$

In a similar way, one can get from (170) their radii

$$r_{\bar{\nu}_\epsilon n} < 1.0886828 \cdot 10^{-45} \text{ m},$$

$$r_{\bar{\nu}_e n} < 2.7536738 \cdot 10^{-37} \text{ m},$$

$$r_{\bar{\nu}_\mu n} < 1.0699246 \cdot 10^{-27} \text{ m},$$

$$r_{\bar{\nu}_\tau n} < 1.0134743 \cdot 10^{-23} \text{ m}.$$

At these values, periods (171) have the restrictions

$$T_{\bar{\nu}_\epsilon n} < 7.0375728 \cdot 10^{-50} \text{ s},$$

$$T_{\bar{\nu}_e n} < 2.8309981 \cdot 10^{-37} \text{ s},$$

$$T_{\bar{\nu}_\mu n} < 6.8564710 \cdot 10^{-23} \text{ s},$$

$$T_{\bar{\nu}_\tau n} < 6.3210611 \cdot 10^{-17} \text{ s}.$$

One can also estimate the absolute energies from (172) that

$$E_{\bar{\nu}_\epsilon n} < 6.4208393 \cdot 10^{20} \text{ eV},$$

$$E_{\bar{\nu}_e n} < 2.5385204 \cdot 10^{12} \text{ eV},$$

$$E_{\bar{\nu}_\mu n} < 6.5334108 \cdot 10^{2} \text{ eV},$$

$$E_{\bar{\nu}_\tau n} < 6.8973205 \cdot 10^{-2} \text{ eV}.$$

Taking into account the availability in $U_{92}^{92}$ of an orbital succession such as

$$U_{92}^{92} \to O_\epsilon^L, \quad O_\epsilon^R, \quad O_e^L, \quad O_e^R, \quad O_\mu^L, \quad O_\mu^R, \quad O_\tau^L, \quad O_\tau^R \to N_\epsilon^o = 1, 2, \quad N_e^o = 3, 4,$$

$$N_\mu^o = 5, 6, \quad N_\tau^o = 7, 8 \to N_\epsilon = 13, 13, \quad N_e = 12, 12, \quad N_\mu = 11, 11, \quad N_\tau = 10, 10,$$

for the speeds (174), in the case of the left-handed leptons, we find that

$$v_{\epsilon p} = 4.3408534 \cdot 10^{-2} \text{ m/s},$$

$$v_{ep} = 2.9858953 \cdot 10^{-5} \text{ m/s},$$

$$v_{\mu p} = 1.5753578 \cdot 10^{-7} \text{ m/s},$$

$$v_{\tau p} = 1.0303643 \cdot 10^{-8} \text{ m/s}.$$

At the availability of (13), (37), (38), (43) and (44), it is not difficult to get from (175) the following radii of lepton orbits of an odd ($N_l^o = 1, 3, 5, 7$) order:

$$r_{\epsilon p} = 5.4509174 \cdot 10^{-33} \text{ m},$$

$$r_{ep} = 1.1520482 \cdot 10^{-26} \text{ m},$$

$$r_{\mu p} = 4.1386757 \cdot 10^{-22} \text{ m},$$

$$r_{\tau p} = 9.6747152 \cdot 10^{-20} \text{ m}.$$

It is also relevant to replace (176) by exact periods

$$T_{\epsilon p} = 7.8899517 \cdot 10^{-31} \text{ s},$$

$$T_{ep} = 2.4242419 \cdot 10^{-21} \text{ s},$$

$$T_{\mu p} = 1.6506768 \cdot 10^{-14} \text{ s},$$

$$T_{\tau p} = 7.8524520 \cdot 10^{-11} \text{ s}.$$

In the same way, one can see that absolute energies (177) are equal to

$$E_{\epsilon p} = 1.2788721 \cdot 10^{8} \text{ eV},$$

$$E_{ep} = 60.5098452 \text{ eV},$$

$$E_{\mu p} = 1.6843615 \cdot 10^{-3} \text{ eV},$$

$$E_{\tau p} = 7.2054072 \cdot 10^{-6} \text{ eV}.$$

These results show clearly that each of our formulas contains all necessary for steadiness and completeness of an atom connections. Some of them state that any of the structural particles suffers in it a strong change in his self radius in the orbit type dependence. This does not imply of course that a lifetime of particles in orbits of nuclei must remain unchangeable. Thereby, a role appears of gravity in an atomic construction.

## 10. Bosons and antineutrinos in atoms with nuclei of a spinless structure

If we choose an atom $pnl\bar{\nu}_l$ with a nucleus $pn$ having an equal quantity of neutrons and antiprotons, at which around each lepton $l$ in orbit of the leptonic string $l\bar{\nu}_l$ moves its own antineutrino $\bar{\nu}_l$, for the case $s = lpn$ and $l = \bar{\nu}_l$ when (119) comes forward as an equality

$$(v^N_{\bar{\nu}_l lpn})^2 r^N_{\bar{\nu}_l lpn} = G_N m_l, \tag{180}$$

we establish here on the basis of (115) and (116) between the variables of atomic system $pnl\bar{\nu}_l$ and its orbital lepton atom $l\bar{\nu}_l$ one more highly characteristic connection

$$\left(\frac{m^o_{l\bar{\nu}_l pn}}{m_{pl}}\right)^2 \frac{m_{pn}}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}} = \left(\frac{m^o_{pnl\bar{\nu}_l}}{m_{pl}}\right)^2 \frac{m_l}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}, \tag{181}$$

where one must keep in mind that

$$m_{l\bar{\nu}_l} = m_l + m_{\bar{\nu}_l}, \quad m_{pn} = m_p + m_n, \tag{182}$$

and $b^{l\bar{\nu}_l pn}_{mn}(b^{pnl\bar{\nu}_l}_{mn})$ denotes the dimensionless size of an orbital mass $m^o_{l\bar{\nu}_l pn}(m^o_{pnl\bar{\nu}_l})$ of an atom in which lepton $l$ (boson $pn$) becomes the nucleus.

An additional index $pn$ in $v^N_{\bar{\nu}_l lpn}$, $r^N_{\bar{\nu}_l lpn}$, $m^o_{l\bar{\nu}_l pn}$ and $b^{l\bar{\nu}_l pn}_{mn}$ distinguishes their from the same sizes in atoms with a nucleus of excess neutrons or antiprotons.

In conformity with the implications of (181), we conclude that

$$\left(\frac{m^o_{l\bar{\nu}_l pn}}{m_{pl}}\right)^2 = \frac{m_{pn}}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}}, \quad b^{l\bar{\nu}_l pn}_{mn} = \frac{m_{pl}}{m_{\bar{\nu}_l}}\sqrt{\frac{m_{pn}}{m_l}}, \tag{183}$$

$$\left(\frac{m^o_{pnl\bar{\nu}_l}}{m_{pl}}\right)^2 = \frac{m_l}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}, \quad b^{pnl\bar{\nu}_l}_{mn} = \frac{m_{pl}}{m_{l\bar{\nu}_l}}\sqrt{\frac{m_l}{m_{pn}}}. \tag{184}$$

Their unification with (181) convinces us here that

$$m_l m_{pn} = m_l m_{pn} \tag{185}$$

at both symmetries of flavor and baryon types.

If relate (183) and (184) to (115) at $s = pn(lpn)$ and $l = l\bar{\nu}_l(\bar{\nu}_l)$, the unidenticality of speeds $v^N_{\bar{\nu}_l lpn} \neq v^N_{l\bar{\nu}_l pn}$ will have the structure

$$\frac{1}{k^N_{l\bar{\nu}_l pn}} \frac{m_{pn}}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}} \neq \frac{1}{k^N_{pnl\bar{\nu}_l}} \frac{m_l}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}. \tag{186}$$

The difference in speeds $v^N_{\bar{\nu}_l lpn}$ and $v^N_{l\bar{\nu}_l pn}$ is a consequence of an orbit quantized succession. Such a symmetry corresponds in (186), namely, in $l\bar{\nu}_l$ and $pnl\bar{\nu}_l$ to the fact that in them

$$k^N_{l\bar{\nu}_l pn} = \frac{m_l}{m_{\bar{\nu}_l}}, \quad k^N_{pnl\bar{\nu}_l} = \frac{m_{pn}}{m_{l\bar{\nu}_l}}. \tag{187}$$

Therefore, it is not surprising that a structural picture of both types of connections (186) and (187) predicts the flavor symmetrical inequality

$$m_{pn} m_{\bar{\nu}_l} \neq m_l m_{l\bar{\nu}_l} \tag{188}$$

at the conservation of lepton and baryon numbers.

Thus, jointly with (183) and first of (187), the equalities (115)-(117) define at $s = lpn(l = \bar{\nu}_l)$ the following intrastring Newton connections:

$$v^N_{\bar{\nu}_l lpn} = \frac{m_{\bar{\nu}_l}}{m_{pl}}\sqrt{\frac{m_{pn}}{m_l}}c, \tag{189}$$

$$r^N_{\bar{\nu}_l lpn} = \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2 \frac{\hbar}{m_{pn}c}, \tag{190}$$

$$E^N_{\bar{\nu}_l lpn} = -\frac{1}{2}\frac{m_{\bar{\nu}_l}}{m_{pl}}\left(\frac{m_{pn}}{m_l}\right)^{3/2} E^N_{\nu_l}. \tag{191}$$

Using (115)-(117) for atoms $s = pn(l = l\bar{\nu}_l)$ accepting (184) and second of (187), we are led to the implications about that

$$v^N_{l\bar{\nu}_l pn} = \frac{m_{l\bar{\nu}_l}}{m_{pl}}\sqrt{\frac{m_l}{m_{pn}}}c, \tag{192}$$

$$r^N_{l\bar{\nu}_l pn} = \left(\frac{m_{pn}}{m_{l\bar{\nu}_l}}\right)^2 \frac{\hbar}{m_l c}, \tag{193}$$

$$E^N_{l\bar{\nu}_l pn} = -\frac{1}{2}\frac{m_{l\bar{\nu}_l}}{m_{pl}}\left(\frac{m_l}{m_{pn}}\right)^{3/2} E^N_{l\bar{\nu}_l}, \tag{194}$$

$$E^N_{l\bar{\nu}_l} = m_{l\bar{\nu}_l}c^2. \tag{195}$$

Another important consequence implied from (183) and (184) is that a relation (107) at $s = pn(lpn)$ and $l = l\bar{\nu}_l(\bar{\nu}_l)$ replaces the inequality $c_m^{l\bar{\nu}_l pn} \neq c_m^{pnl\bar{\nu}_l}$ for

$$\left(\frac{e^o_{l\bar{\nu}_l pn}}{e_{pl}}\right)^2 \frac{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}}{m_{pn}} \neq \left(\frac{e^o_{pnl\bar{\nu}_l}}{e_{pl}}\right)^2 \frac{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}{m_l} \tag{196}$$

in which an orbital charge $e^o_{l\bar{\nu}_l pn}(e^o_{pnl\bar{\nu}_l})$ of atomic system $l\bar{\nu}_l(pnl\bar{\nu}_l)$ with a nucleus $l(pn)$ includes its dimensionless size.

Here it is relevant to note that a flavor symmetry in (196) is fully compatible with ideas of a baryon symmetry. Such a principle defines $(e^o_{l\bar{\nu}_l pn}/e_{pl})^2$ and $(e^o_{pnl\bar{\nu}_l}/e_{pl})^2$ in a general form

$$\left(\frac{e^o_{l\bar{\nu}_l pn}}{e_{pl}}\right)^2 = \frac{m_l}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}}, \quad b^{l\bar{\nu}_l pn}_{ch} = \frac{m_l}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}}\frac{e^2_{pl}}{e_l e_{\bar{\nu}_l}}, \tag{197}$$

$$\left(\frac{e^o_{pnl\bar{\nu}_l}}{e_{pl}}\right)^2 = \frac{m_{pn}}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}, \quad b^{pnl\bar{\nu}_l}_{ch} = \frac{m_{pn}}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}\frac{e^2_{pl\bar{\nu}_l}}{e_{pn}e_{l\bar{\nu}_l}}. \tag{198}$$

Together with them, (183) and (184) constitute the two united connections from (107) in the atomic nucleus type dependence

$$c_m^{l\bar{\nu}_l pn} = \frac{m_l}{m_{pn}}, \quad c_m^{pnl\bar{\nu}_l} = \frac{m_{pn}}{m_l} \tag{199}$$

and thereby confirms the fact that nature does not exclude neither a flavor nor a baryon symmetry of the inequality of a relation (107) for the two corresponding types of atoms.

In these circumstances, (196) becomes the flavor symmetrical inequality

$$m_l^2 \neq m_{pn}^2, \tag{200}$$

and the unidenticality $v^C_{\bar{\nu}_l lpn} \neq v^C_{l\bar{\nu}_l pn}$ in speeds (122) at the Coulomb construction of atomic systems $l\bar{\nu}_l$ and $pnl\bar{\nu}_l$ behaves as

$$\frac{1}{k^C_{l\bar{\nu}_l pn}} \frac{m_l}{b^{l\bar{\nu}_l pn}_{mn} m_{\bar{\nu}_l}} \neq \frac{1}{k^C_{pnl\bar{\nu}_l}} \frac{m_{pn}}{b^{pnl\bar{\nu}_l}_{mn} m_{l\bar{\nu}_l}}. \tag{201}$$

However, in spite of this, $(1/k_{l\bar{\nu}_l pn})$ and $(1/k_{pnl\bar{\nu}_l})$ lead us from (186) and (201) to the same inequality (188) implied from (201) only in the case when

$$k^C_{l\bar{\nu}_l pn} = \frac{m_{\bar{\nu}_l}}{m_{pn}}, \quad k^C_{pnl\bar{\nu}_l} = \frac{m_{l\bar{\nu}_l}}{m_l}. \tag{202}$$

But here we must recognize that

$$k^C_{l\bar{\nu}_l pn} = c^{l\bar{\nu}_l pn}_k k^N_{l\bar{\nu}_l pn}, \quad k^C_{pnl\bar{\nu}_l} = c^{pnl\bar{\nu}_l}_k k^N_{pnl\bar{\nu}_l}, \tag{203}$$

$$c^{l\bar{\nu}_l pn}_k = \frac{m^2_{\bar{\nu}_l}}{m_{pn} m_l}, \quad c^{pnl\bar{\nu}_l}_k = \frac{m^2_{l\bar{\nu}_l}}{m_{pn} m_l}. \tag{204}$$

By following the structure of (197) including the second of (199), (202) and

$$b^{l\bar{\nu}_l pn}_{mc} = c^{l\bar{\nu}_l pn}_m b^{l\bar{\nu}_l pn}_{mn}, \quad b^{pnl\bar{\nu}_l}_{mc} = c^{pnl\bar{\nu}_l}_m b^{pnl\bar{\nu}_l}_{mn}, \tag{205}$$

one can find at $s = lpn(l = \bar{\nu}_l)$ from (122)-(124) that the intrastring Coulomb connections in atoms $pnl\bar{\nu}_l$ have the form

$$v^C_{\bar{\nu}_l lpn} = \frac{m_l}{m_{\bar{\nu}_l}} \sqrt{\frac{m_{pn} m_l}{m^2_{pl}}} c, \tag{206}$$

$$r^C_{\bar{\nu}_l lpn} = \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^2 \frac{\hbar}{m_{pn} c}, \tag{207}$$

$$E^C_{\bar{\nu}_l lpn} = -\frac{1}{2} \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pn} m_l}{m^2_{pl}}} E^C_l, \tag{208}$$

$$E^C_l = m_l c^2. \tag{209}$$

The solution (198) together with the second of (199), (202) and (205) at the use of (122)-(124) for an atom $s = pn(l = l\bar{\nu}_l)$ allows to derive four more other equations:

$$v^C_{l\bar{\nu}_l pn} = \frac{m_{pn}}{m_{l\bar{\nu}_l}} \sqrt{\frac{m_{pn} m_l}{m^2_{pl}}} c, \tag{210}$$

$$r^C_{l\bar{\nu}_l pn} = \left(\frac{m_{l\bar{\nu}_l}}{m_{pn}}\right)^2 \frac{\hbar}{m_l c}, \tag{211}$$

$$E^C_{l\bar{\nu}_l p} = -\frac{1}{2} \left(\frac{m_{pn}}{m_{l\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pn} m_l}{m^2_{pl}}} E^C_{pn}, \tag{212}$$

$$E^C_{pn} = m_{pn} c^2. \tag{213}$$

The intrastring functions (206) and (210) are incompatible with (189), (192) and that, consequently, among them there are the structural relations

$$v^C_{\bar{\nu}_l lpn} = c^{l\bar{\nu}_l pn}_v v^N_{\bar{\nu}_l l}, \quad v^C_{l\bar{\nu}_l pn} = c^{pnl\bar{\nu}_l}_v v^N_{l\bar{\nu}_l pn}, \tag{214}$$

$$c_v^{l\bar{\nu}_l pn} = \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2, \quad c_v^{pnl\bar{\nu}_l} = \left(\frac{m_{pn}}{m_{l\bar{\nu}_l}}\right)^2. \tag{215}$$

If compare (190), (193), (207) and (211), one can see that

$$r^C_{\bar{\nu}_l lpn} = c_r^{l\bar{\nu}_l pn} r^N_{\bar{\nu}_l lpn}, \quad r^C_{l\bar{\nu}_l pn} = c_r^{pnl\bar{\nu}_l} r^N_{l\bar{\nu}_l pn}, \tag{216}$$

$$c_r^{l\bar{\nu}_l pn} = \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^4, \quad c_r^{pnl\bar{\nu}_l} = \left(\frac{m_{l\bar{\nu}_l}}{m_{pn}}\right)^4. \tag{217}$$

In the establishment of (206), (207), (210) and (211), we have used the relation (107), because in it appear the dynamical aspects of a Planck particle responsible for harmony of all types of forces of the Coulomb and Newton nature. Insofar as its role allowing to uncover (115), (116) and to include in the discussion their contributions is concerned, it calls for special presentation.

However, the fact that the existence itself of atomic system does not exclude the intraatomic harmony of forces of a different nature, testifies about a role of gravity in its construction. The functions (115)-(117) must therefore be comparable with (122)-(124) at the unification in a unified whole. But here we can use, for example, the same contributions (166), recognizing that any of (163)-(165) would redouble their.

The number of both antineutrinos and leptons in $l\bar{\nu}_l$ is not different from the unity. Such an equality, however, takes place regardless of the boson structure of atomic system $pnl\bar{\nu}_l$, namely, of that in it

$$N_{pn} = N_p, \quad N_{l\bar{\nu}_l} = N_l. \tag{218}$$

Thus, (206-(208) at $N_p > 1$ lead us from (166) to

$$v_{\bar{\nu}_l lpn} = \frac{m_l}{m_{\bar{\nu}_l}} \sqrt{\frac{m_{pn} m_l}{m_{pl}^2}} c, \tag{219}$$

$$r_{\bar{\nu}_l lpn} = \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^2 \frac{\hbar}{m_{pn} c}, \tag{220}$$

$$T_{\bar{\nu}_l lpn} = \frac{2\pi}{c} \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pn} m_l} \frac{\hbar}{m_{pn} c}}, \tag{221}$$

$$E_{\bar{\nu}_l lpn} = -\frac{1}{2} \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pn} m_l}{m_{pl}^2}} E_l, \tag{222}$$

$$E_l = m_l c^2, \quad m_{pn} = N_p (m_p + m_n). \tag{223}$$

Taking into account that the presence of (218) in (210)-(212) generalizes (166) for all types of atomic systems with the spinless nuclei, from them, we get

$$v_{l\bar{\nu}_l pn} = \frac{m_{pn}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}} \sqrt{\frac{m_{pn} m_l}{m_{pl}^2}} c, \tag{224}$$

$$r_{l\bar{\nu}_l pn} = \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pn}}\right)^2 \frac{\hbar}{m_l c}, \tag{225}$$

$$T_{l\bar{\nu}_l pn} = \frac{2\pi}{c} \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pn}}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pn} m_l} \frac{\hbar}{m_l c}}, \tag{226}$$

$$E_{l\bar{\nu}_l pn} = -\frac{1}{2}\left(\frac{m_{pn}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pn} m_l}{m_{pl}^2}} E_{pn}, \tag{227}$$

$$E_{pn} = m_{pn} c^2. \tag{228}$$

To show their structural features, one can use the uranium

$$U_{92}^{184} \rightarrow O_{\epsilon\bar{\nu}_\epsilon}^L, \quad O_{\epsilon\bar{\nu}_\epsilon}^R, \quad O_{e\bar{\nu}_e}^L, \quad O_{e\bar{\nu}_e}^R, \quad O_{\mu\bar{\nu}_\mu}^L, \quad O_{\mu\bar{\nu}_\mu}^R, \quad O_{\tau\bar{\nu}_\tau}^L, \quad O_{\tau\bar{\nu}_\tau}^R \rightarrow N_{\epsilon\bar{\nu}_\epsilon}^o = 1, 2,$$

$$N_{e\bar{\nu}_e}^o = 3, 4, \quad N_{\mu\bar{\nu}_\mu}^o = 5, 6, \quad N_{\tau\bar{\nu}_\tau}^o = 7, 8 \rightarrow N_{\epsilon\bar{\nu}_\epsilon} = 13, 13, \quad N_{e\bar{\nu}_e} = 12, 12,$$

$$N_{\mu\bar{\nu}_\mu} = 11, 11, \quad N_{\tau\bar{\nu}_\tau} = 10, 10.$$

It has been mentioned earlier that (19), (40), (41), (43) and (44) are the masses of the left-handed fermions. This allows to choose only those boson orbits in which there are no right-handed particles. For such a connection we must at first establish an intrastring picture of the right-handed antineutrinos.

Their speed is predicted in (219) as

$$v_{\bar{\nu}_\epsilon \epsilon pn} < 4.1108353 \cdot 10^{-7} \text{ m/s},$$

$$v_{\bar{\nu}_e e pn} < 1.4912703 \cdot 10^{-6} \text{ m/s},$$

$$v_{\bar{\nu}_\mu \mu pn} < 6.5203866 \cdot 10^{-8} \text{ m/s},$$

$$v_{\bar{\nu}_\tau \tau pn} < 4.2007081 \cdot 10^{-8} \text{ m/s}.$$

The radii (220) lie herewith in the limits

$$r_{\bar{\nu}_\epsilon \epsilon pn} < 2.2845487 \cdot 10^{-31} \text{ m},$$

$$r_{\bar{\nu}_e e pn} < 2.7340753 \cdot 10^{-29} \text{ m},$$

$$r_{\bar{\nu}_\mu \mu pn} < 2.9570621 \cdot 10^{-24} \text{ m},$$

$$r_{\bar{\nu}_\tau \tau pn} < 1.1982383 \cdot 10^{-22} \text{ m}.$$

To any type of antineutrino corresponds in (221) a kind of period

$$T_{\bar{\nu}_\epsilon \epsilon pn} < 2.4690803 \cdot 10^{-24} \text{ s},$$

$$T_{\bar{\nu}_e e pn} < 1.1519508 \cdot 10^{-23} \text{ s},$$

$$T_{\bar{\nu}_\mu \mu pn} < 2.8494889 \cdot 10^{-16} \text{ s},$$

$$T_{\bar{\nu}_\tau \tau pn} < 1.7922582 \cdot 10^{-14} \text{ s}.$$

The absolute sizes of energies (222) give an estimate

$$E_{\bar{\nu}_\epsilon \epsilon pn} < 4.9738413 \cdot 10^{-7} \text{ eV},$$

$$E_{\bar{\nu}_e e pn} < 2.5976213 \cdot 10^{-4} \text{ eV},$$

$$E_{\bar{\nu}_\mu \mu pn} < 1.4281760 \cdot 10^{-5} \text{ eV},$$

$$E_{\bar{\nu}_\tau \tau pn} < 1.2154597 \cdot 10^{-5} \text{ eV}.$$

Having (167), (224) and by following the above orbital structure of uranium $U_{92}^{184}$, for the speeds of the left-handed leptonic strings $l\bar{\nu}_l$ with a mass from (182), we find

$$v_{\epsilon\bar{\nu}_\epsilon pn} = 7.5299171 \cdot 10^{-6} \text{ m/s},$$

$$v_{e\bar{\nu}_e pn} = 2.0555165 \cdot 10^{-7} \text{ m/s},$$
$$v_{\mu\bar{\nu}_\mu pn} = 1.5569310 \cdot 10^{-8} \text{ m/s},$$
$$v_{\tau\bar{\nu}_\tau pn} = 4.1404189 \cdot 10^{-9} \text{ m/s}.$$

Basing on (225), one can also estimate their radii

$$r_{\epsilon\bar{\nu}_\epsilon pn} = 3.6255062 \cdot 10^{-25} \text{ m},$$
$$r_{e\bar{\nu}_e pn} = 4.8652716 \cdot 10^{-22} \text{ m},$$
$$r_{\mu\bar{\nu}_\mu pn} = 8.4802819 \cdot 10^{-20} \text{ m},$$
$$r_{\tau\bar{\nu}_\tau pn} = 1.1991140 \cdot 10^{-18} \text{ m}.$$

Under such circumstances, the periods (226) are reduced to that

$$T_{\epsilon\bar{\nu}_\epsilon pn} = 3.0252295 \cdot 10^{-19} \text{ s},$$
$$T_{e\bar{\nu}_e pn} = 1.4871883 \cdot 10^{-14} \text{ s},$$
$$T_{\mu\bar{\nu}_\mu pn} = 3.4223212 \cdot 10^{-11} \text{ s},$$
$$T_{\tau\bar{\nu}_\tau pn} = 1.8196843 \cdot 10^{-9} \text{ s}.$$

The absolute values of energies (227) become equal to

$$E_{\epsilon\bar{\nu}_\epsilon pn} = 8.8858837 \cdot 10^{4} \text{ eV},$$
$$E_{e\bar{\nu}_e pn} = 1.6685178 \text{ eV},$$
$$E_{\mu\bar{\nu}_\mu pn} = 1.3314219 \cdot 10^{-3} \text{ eV},$$
$$E_{\tau\bar{\nu}_\tau pn} = 2.2960163 \cdot 10^{-5} \text{ eV}.$$

One of a set of features of these results is that

$$v_{\bar{\nu}_l lpn} < v_{l\bar{\nu}_l pn}, \quad r_{\bar{\nu}_l lpn} < r_{l\bar{\nu}_l pn}, \tag{229}$$

$$T_{\bar{\nu}_l lpn} < T_{l\bar{\nu}_l pn}, \quad E_{\bar{\nu}_l lpn} < E_{l\bar{\nu}_l pn} \tag{230}$$

are compatible with that exist between the objects of solar system.

## 11. Leptons around the nucleus of an excess neutron or antiproton

For the orbital motion of leptonic $l\bar{\nu}_l$ strings a nucleus $pn$ with zero spin and isospin is not the only intraatomic object having the boson orbits. They can appear in an atom even at the availability in it of a nucleus $pnn$ or $pnp$, namely, of a nucleus with excess neutrons or antiprotons. In the first case, from our earlier developments, we find a set of atoms $pnnl\bar{\nu}_l\bar{\nu}_l$, around the nucleus of which move not only the leptonic $l\bar{\nu}_l$ strings but also the antineutrinos $\bar{\nu}_l$ from the families of leptons. The nucleus of an atom $pnpl\bar{\nu}_l l$ for the second case must have the string as well as the lepton orbits. In other words, among its orbital particles one can find both bosons $l\bar{\nu}_l$ and leptons $l$, each of which rotates in his orbit.

In both atoms, as we can expect from the circumstances in the preceding section, $l\bar{\nu}_l$ cannot change his orbit quantized succession, so that there exists a connection between the atomic systems $pnnl\bar{\nu}_l\bar{\nu}_l$ and $pnpl\bar{\nu}_l l$, and a relation (107) for $pnn\bar{\nu}_l$ and $pnpl$ does not coincide, owing to which, (119) holds regardless of sizes of variables. Therefore, to use their in construction of the intraatomic functions $v_{ls}$, $r_{ls}$, $T_{ls}$ and $E_{ls}$ at $s = pnp(pnn)$ and $l = l(\bar{\nu}_l)$, one must apply to replacements

$$N_n m_n \to m_{pnn}, \quad N_p m_p \to m_{pnp}, \tag{231}$$

because they can generalize the earlier equations (126)-(178) to the case of the investigated types of nuclei with a nonzero spin. At such a choice of objects, (151)-(153) define the structure of (169)-(172) as follows:

$$v_{\bar{\nu}_l pnn} = \frac{m_{pnn}}{N_{\bar{\nu}_l} m_{\bar{\nu}_l}} \sqrt{\frac{m_{pnp} m_{pnn}}{m_{pl}^2}} c, \tag{232}$$

$$r_{\bar{\nu}_l pnn} = \left(\frac{N_{\bar{\nu}_l} m_{\bar{\nu}_l}}{m_{pnn}}\right)^2 \frac{\hbar}{m_{pnp} c}, \tag{233}$$

$$T_{\bar{\nu}_l pnn} = \frac{2\pi}{c} \left(\frac{N_{\bar{\nu}_l} m_{\bar{\nu}_l}}{m_{pnn}}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pnp} m_{pnn}}} \frac{\hbar}{m_{pnp} c}, \tag{234}$$

$$E_{\bar{\nu}_l pnn} = -\frac{1}{2} \left(\frac{m_{pnn}}{N_{\bar{\nu}_l} m_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pnp} m_{pnn}}{m_{pl}^2}} E_{pnn}, \tag{235}$$

$$E_{pnn} = m_{pnn} c^2, \quad m_{pnn} = m_{pn} + (A - 2N_p) m_n, \quad m_{pnp} = m_{pn} + (A - 2N_p) m_p. \tag{236}$$

At the same time, (231) replace (174)-(177) for

$$v_{lpnp} = \frac{m_{pnp}}{N_l m_l} \sqrt{\frac{m_{pnp} m_{pnn}}{m_{pl}^2}} c, \tag{237}$$

$$r_{lpnp} = \left(\frac{N_l m_l}{m_{pnp}}\right)^2 \frac{\hbar}{m_{pnn} c}, \tag{238}$$

$$T_{lpnp} = \frac{2\pi}{c} \left(\frac{N_l m_l}{m_{pnp}}\right)^3 \sqrt{\frac{m_{pl}^2}{m_p m_{pnn}}} \frac{\hbar}{m_{pnn} c}, \tag{239}$$

$$E_{lpnp} = -\frac{1}{2} \left(\frac{m_{pnp}}{N_l m_l}\right)^2 \sqrt{\frac{m_{pnp} m_{pnn}}{m_{pl}^2}} E_{pnp}, \tag{240}$$

$$E_{pnp} = m_{pnp} c^2. \tag{241}$$

Returning to the orbital structure of an atom $U_{92}^{238}$ in the third section, we remark that jointly with (19), (40), (41), (43) and (44), the solution (232) predicts the sizes of speeds of the right-handed antineutrinos

$$v_{\bar{\nu}_\epsilon pnn} < 1.0564742 \cdot 10^6 \text{ m/s},$$

$$v_{\bar{\nu}_e pnn} < 7.0078241 \cdot 10^{-1} \text{ m/s},$$

$$v_{\bar{\nu}_\mu pnn} < 1.2023227 \cdot 10^{-3} \text{ m/s},$$

$$v_{\bar{\nu}_\tau pnn} < 1.1230487 \cdot 10^{-5} \text{ m/s}.$$

The radii (233) of their orbits have the restrictions

$$r_{\bar{\nu}_\epsilon pnn} < 2.3826388 \cdot 10^{-47} \text{ m},$$

$$r_{\bar{\nu}_e pnn} < 5.4151396 \cdot 10^{-39} \text{ m},$$

$$r_{\bar{\nu}_\mu pnn} < 1.8396445 \cdot 10^{-29} \text{ m},$$

$$r_{\bar{\nu}_\tau pnn} < 2.1085254 \cdot 10^{-25} \text{ m}.$$

In these orbits, the periods (234) behave as

$$T_{\bar{\nu}_\epsilon pnn} < 1.4170303 \cdot 10^{-59} \text{ s},$$

$$T_{\bar{\nu}_e pnn} < 4.8551911 \cdot 10^{-40} \text{ s},$$

$$T_{\bar{\nu}_\mu pnn} < 9.6137473 \cdot 10^{-26} \text{ s},$$

$$T_{\bar{\nu}_\tau pnn} < 1.1796688 \cdot 10^{-19} \text{ s}.$$

The absolute energies from (235) one can reduce to

$$E_{\bar{\nu}_\epsilon pnn} < 7.5816144 \cdot 10^{22} \text{ eV},$$

$$E_{\bar{\nu}_e pnn} < 3.3358787 \cdot 10^{14} \text{ eV},$$

$$E_{\bar{\nu}_\mu pnn} < 9.8194238 \cdot 10^{4} \text{ eV},$$

$$E_{\bar{\nu}_\tau pnn} < 8.5672427 \text{ eV}.$$

Their comparison with estimates (169)-(172) for the atom $Fn_{92}^{92}$ from an uranium family convinces us once more in the existence of inequalities

$$v_{\bar{\nu}_l n} < v_{\bar{\nu}_l pnn}, \quad r_{\bar{\nu}_l n} > r_{\bar{\nu}_l pnn}, \tag{242}$$

$$T_{\bar{\nu}_l n} > T_{\bar{\nu}_l pnn}, \quad E_{\bar{\nu}_l n} < E_{\bar{\nu}_l pnn}. \tag{243}$$

Such an implication one can make by investigating the orbital structure of an uranium

$$U_{92}^{130} \rightarrow O_\epsilon^L, \ O_\epsilon^R, \ O_e^L, \ O_e^R, \ O_\mu^L, \ O_\mu^R, \ O_\tau^L, \ O_\tau^R, \ O_{\epsilon\bar{\nu}_\epsilon}^L, \ O_{\epsilon\bar{\nu}_\epsilon}^R, \ O_{e\bar{\nu}_e}^L, \ O_{e\bar{\nu}_e}^R,$$

$$O_{\mu\bar{\nu}_\mu}^L, \ O_{\mu\bar{\nu}_\mu}^R, \ O_{\tau\bar{\nu}_\tau}^L, \ O_{\tau\bar{\nu}_\tau}^R \rightarrow N_\epsilon^o = 1,2, \quad N_e^o = 3,4 \quad N_\mu^o = 5,6, \quad N_\tau^o = 7,8,$$

$$N_{\epsilon\bar{\nu}_\epsilon}^o = 9,10, \quad N_{e\bar{\nu}_e}^o = 11,12, \quad N_{\mu\bar{\nu}_\mu}^o = 13,14, \quad N_{\tau\bar{\nu}_\tau}^o = 15,16 \rightarrow N_\epsilon = 8,8,$$

$$N_e = 7,7, \quad N_\mu = 6,6, \quad N_\tau = 6,6, \quad N_{\epsilon\bar{\nu}_\epsilon} = 6,6,$$

$$N_{e\bar{\nu}_e} = 5,5, \quad N_{\mu\bar{\nu}_\mu} = 4,4, \quad N_{\tau\bar{\nu}_\tau} = 4,4$$

having both lepton and string orbits.

The function (237) together with (13), (37), (38), (43) and (44) define the speeds of leptons in their orbits of an odd ($N_l^o = 1,3,5,7$) order

$$v_{\epsilon pnp} = 1.4090116 \cdot 10^{-1} \text{ m/s},$$

$$v_{epnp} = 1.0224542 \cdot 10^{-4} \text{ m/s},$$

$$v_{\mu pnp} = 5.7690824 \cdot 10^{-7} \text{ m/s},$$

$$v_{\tau pnp} = 3.4302491 \cdot 10^{-8} \text{ m/s}.$$

In a given case, from (238), we are led to radii

$$r_{\epsilon pnp} = 7.3134310 \cdot 10^{-34} \text{ m},$$

$$r_{epnp} = 1.3888731 \cdot 10^{-27} \text{ m},$$

$$r_{\mu pnp} = 4.3625140 \cdot 10^{-23} \text{ m},$$

$$r_{\tau pnp} = 1.2339540 \cdot 10^{-19} \text{ m}.$$

The periods (239) have herewith the values

$$T_{\epsilon pnp} = 1.3045071 \cdot 10^{-31} \text{ s},$$

$$T_{epnp} = 8.5349025 \cdot 10^{-23} \text{ s},$$

$$T_{\mu pnp} = 4.7512727 \cdot 10^{-16} \text{ s},$$

$$T_{\tau pnp} = 2.2602329 \cdot 10^{-12} \text{ s}.$$

The absolute energies finding from (240) are equal to

$$E_{\epsilon pnp} = 1.3479720 \cdot 10^{9} \text{ eV},$$

$$E_{epnp} = 7.0980572 \cdot 10^{2} \text{ eV},$$

$$E_{\mu pnp} = 2.2597751 \cdot 10^{-2} \text{ eV},$$

$$E_{\tau pnp} = 7.9891959 \cdot 10^{-5} \text{ eV}.$$

These sizes and those estimates, which follow from (174)-(177) for the uranium $U_{92}^{92}$ and its family, satisfy the conditions

$$v_{lp} < v_{lpnp}, \quad r_{lp} > r_{lpnp}, \tag{244}$$

$$T_{ep} > T_{lpnp}, \quad E_{lp} < E_{lpnp}. \tag{245}$$

They similarly to ratios (242) and (243) reflect just the fact that each of the existing types of nuclei constitutes a kind of atomic system.

## 12. Leptonic strings in atoms with neutron excess nuclei

A general picture of atomic system, according to the preceding reasoning, is essentially changed in the nucleus isotopic structure dependence.

To express its idea more clearly, one must use a replacement

$$m_{pn} \to m_{pnn} \tag{246}$$

in (180)-(227) for the systems $pnnl\bar{\nu}_l$ and $l\bar{\nu}_l$ as a unity of flavor and baryon symmetry laws. This just replaces (219)-(222) with

$$v_{\bar{\nu}_l lpnn} = \frac{m_l}{m_{\bar{\nu}_l}} \sqrt{\frac{m_{pnn} m_l}{m_{pl}^2}} c, \tag{247}$$

$$r_{\bar{\nu}_l lpnn} = \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^2 \frac{\hbar}{m_{pnn} c}, \tag{248}$$

$$T_{\bar{\nu}_l lpnn} = \frac{2\pi}{c} \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pnn} m_l} \frac{\hbar}{m_{pnn} c}}, \tag{249}$$

$$E_{\bar{\nu}_l lpnn} = -\frac{1}{2} \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pnn} m_l}{m_{pl}^2}} E_l. \tag{250}$$

The account of (246) gives the chance for transition from (224)-(227) into

$$v_{l\bar{\nu}_l pnn} = \frac{m_{pnn}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}} \sqrt{\frac{m_{pnn} m_l}{m_{pl}^2}} c, \tag{251}$$

$$r_{l\bar{\nu}_l pnn} = \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pnn}}\right)^2 \frac{\hbar}{m_l c}, \tag{252}$$

$$T_{l\bar{\nu}_l pnn} = \frac{2\pi}{c} \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pnn}}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pnn} m_l}} \frac{\hbar}{m_l c}, \tag{253}$$

$$E_{l\bar{\nu}_l pnn} = -\frac{1}{2} \left(\frac{m_{pnn}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pnn} m_l}{m_{pl}^2}} E_{pnn}. \tag{254}$$

Therefore, if we start from the orbital structure of uranium $U_{92}^{238}$, making the explicit evaluations, one can establish the quantitative restrictions on the intrastring functions (247)-(250) for antineutrinos of the left-handed strings.

The speeds (247) come forward in them as

$$v_{\bar{\nu}_\epsilon \epsilon pnn} < 4.6756670 \cdot 10^{-7} \text{ m/s},$$

$$v_{\bar{\nu}_e e pnn} < 1.6961719 \cdot 10^{-6} \text{ m/s},$$

$$v_{\bar{\nu}_\mu \mu pnn} < 7.4162924 \cdot 10^{-8} \text{ m/s},$$

$$v_{\bar{\nu}_\tau \tau pnn} < 4.7778884 \cdot 10^{-8} \text{ m/s}.$$

To any type of speed corresponds in (248) a kind of radius

$$r_{\bar{\nu}_\epsilon \epsilon pnn} < 1.7659297 \cdot 10^{-31} \text{ m},$$

$$r_{\bar{\nu}_e e pnn} < 2.1134086 \cdot 10^{-29} \text{ m},$$

$$r_{\bar{\nu}_\mu \mu pnn} < 2.2857749 \cdot 10^{-24} \text{ m},$$

$$r_{\bar{\nu}_\tau \tau pnn} < 9.2622443 \cdot 10^{-23} \text{ m}.$$

The periods (249) are restricted herewith by sizes

$$T_{\bar{\nu}_\epsilon \epsilon pnn} < 1.6780106 \cdot 10^{-24} \text{ s},$$

$$T_{\bar{\nu}_e e pnn} < 7.8287687 \cdot 10^{-23} \text{ s},$$

$$T_{\bar{\nu}_\mu \mu pnn} < 1.9365400 \cdot 10^{-16} \text{ s},$$

$$T_{\bar{\nu}_\tau \tau pnn} < 1.2180359 \cdot 10^{-14} \text{ s}.$$

Analysis of the absolute energies from (250) assumed that

$$E_{\bar{\nu}_\epsilon \epsilon pnn} < 5.6572506 \cdot 10^{-7} \text{ eV},$$

$$E_{\bar{\nu}_e e pnn} < 5.9090728 \cdot 10^{-4} \text{ eV},$$

$$E_{\bar{\nu}_\mu \mu pnn} < 1.6244084 \cdot 10^{-2} \text{ eV},$$

$$E_{\bar{\nu}_\tau \tau pnn} < 2.7649296 \cdot 10^{-2} \text{ eV}.$$

At their comparison with estimates implied from (219)-(222) for the uranium $U_{92}^{184}$, only the part is obtained of its general picture in which

$$v_{\bar{\nu}_l lpn} < v_{\bar{\nu}_l lpnn}, \quad r_{\bar{\nu}_l lpn} > r_{\bar{\nu}_l lpnn}, \tag{255}$$

$$T_{\bar{\nu}_l lpn} > T_{\bar{\nu}_l lpnn}, \quad E_{\bar{\nu}_l lpn} < E_{\bar{\nu}_l lpnn}. \tag{256}$$

Insofar as the behavior of $l\bar{\nu}_l$ in atom $U_{92}^{238}$ is concerned, the sizes of speeds (251) for the odd $(N_{l\bar{\nu}_l}^{o} = 9, 11, 13, 15)$ case of an order of orbits of leptonic strings have the values

$$v_{\epsilon\bar{\nu}_\epsilon pnn} = 1.1079768 \cdot 10^{-5} \text{ m/s},$$

$$v_{e\bar{\nu}_e pnn} = 3.0245549 \cdot 10^{-7} \text{ m/s},$$

$$v_{\mu\bar{\nu}_\mu pnn} = 2.2909197 \cdot 10^{-8} \text{ m/s},$$

$$v_{\tau\bar{\nu}_\tau pnn} = 6.0923491 \cdot 10^{-9} \text{ m/s}.$$

One can also estimate the radii (252) that

$$r_{\epsilon\bar{\nu}_\epsilon pnn} = 2.1662803 \cdot 10^{-25} \text{ m},$$

$$r_{e\bar{\nu}_e pnn} = 2.9070540 \cdot 10^{-22} \text{ m},$$

$$r_{\mu\bar{\nu}_\mu pnn} = 5.0670629 \cdot 10^{-20} \text{ m},$$

$$r_{\tau\bar{\nu}_\tau pnn} = 7.1648398 \cdot 10^{-19} \text{ m}.$$

To them refer the periods (253) equal to

$$T_{\epsilon\bar{\nu}_\epsilon pnn} = 1.2284679 \cdot 10^{-19} \text{ s},$$

$$T_{e\bar{\nu}_e pnn} = 6.0390899 \cdot 10^{-15} \text{ s},$$

$$T_{\mu\bar{\nu}_\mu pnn} = 1.3897167 \cdot 10^{-11} \text{ s},$$

$$T_{\tau\bar{\nu}_\tau pnn} = 7.3892705 \cdot 10^{-10} \text{ s}.$$

They are the consequence of energies (254) with the absolute values

$$E_{\epsilon\bar{\nu}_\epsilon pnn} = 2.1882407 \cdot 10^{5} \text{ eV},$$

$$E_{e\bar{\nu}_e pnn} = 4.1088979 \text{ eV},$$

$$E_{\mu\bar{\nu}_\mu pnn} = 1.6393821 \cdot 10^{-3} \text{ eV},$$

$$E_{\tau\bar{\nu}_\tau pnn} = 2.8270889 \cdot 10^{-5} \text{ eV}.$$

If we now compare their with those which follow from (224)-(227) for the uranium $U_{92}^{184}$ not having neither a spin nor an isospin, we see that

$$v_{l\bar{\nu}_l pn} < v_{l\bar{\nu}_l pnn}, \quad r_{e\bar{\nu}_e pn} > r_{l\bar{\nu}_l pnn}, \tag{257}$$

$$T_{l\bar{\nu}_l pn} > T_{l\bar{\nu}_l pnn}, \quad E_{l\bar{\nu}_l pn} < E_{l\bar{\nu}_l pnn}. \tag{258}$$

As well as in (229) and (230), finding estimates here constitute the inequalities

$$v_{\bar{\nu}_l lpnn} < v_{l\bar{\nu}_l pnn}, \quad r_{\bar{\nu}_l lpnn} < r_{l\bar{\nu}_l pnn}, \tag{259}$$

$$T_{\bar{\nu}_l lpnn} < T_{l\bar{\nu}_l pnn}, \quad E_{\bar{\nu}_l lpnn} < E_{l\bar{\nu}_l pnn} \tag{260}$$

not depending on the spin and isospin structure of a nucleus.

## 13. Atoms with antiproton excess nuclei of orbital strings

It is particularly important to notice that although the inequalities such as (229), (230), (259) and (260) exist between the Earth, Moon and the Sun, their availability in atomic system does not exclude an explicit nucleus spin and isospin dependence of its general picture. To solve this question from the point of view of an excess antiproton, one must choose a replacement

$$m_{pn} \rightarrow m_{pnp} \tag{261}$$

for the establishment of nature of systems $pnpl\bar{\nu}_l$ and $l\bar{\nu}_l$ generalizing (180)-(227) to their case. Of course, (219)-(222) have herewith the following structure:

$$v_{\bar{\nu}_l lpnp} = \frac{m_l}{m_{\bar{\nu}_l}} \sqrt{\frac{m_{pnp} m_l}{m_{pl}^2}} c, \tag{262}$$

$$r_{\bar{\nu}_l lpnp} = \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^2 \frac{\hbar}{m_{pnp} c}, \tag{263}$$

$$T_{\bar{\nu}_l lpnp} = \frac{2\pi}{c} \left(\frac{m_{\bar{\nu}_l}}{m_l}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pnp} m_l}} \frac{\hbar}{m_{pnp} c}, \tag{264}$$

$$E_{\bar{\nu}_l lpnp} = -\frac{1}{2} \left(\frac{m_l}{m_{\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pnp} m_l}{m_{pl}^2}} E_l. \tag{265}$$

These intrastring connections are carried out in atom $pnpl\bar{\nu}_l$, for which (261) generalizes the structural functions (224)-(227) leading their to the form

$$v_{l\bar{\nu}_l pnp} = \frac{m_{pnp}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}} \sqrt{\frac{m_{pnp} m_l}{m_{pl}^2}} c, \tag{266}$$

$$r_{l\bar{\nu}_l pnp} = \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pnp}}\right)^2 \frac{\hbar}{m_l c}, \tag{267}$$

$$T_{l\bar{\nu}_l pnp} = \frac{2\pi}{c} \left(\frac{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}{m_{pnp}}\right)^3 \sqrt{\frac{m_{pl}^2}{m_{pnp} m_l}} \frac{\hbar}{m_l c}, \tag{268}$$

$$E_{l\bar{\nu}_l pnp} = -\frac{1}{2} \left(\frac{m_{pnp}}{N_{l\bar{\nu}_l} m_{l\bar{\nu}_l}}\right)^2 \sqrt{\frac{m_{pnp} m_l}{m_{pl}^2}} E_{pnp}. \tag{269}$$

We will now make on the basis of (262)-(269) the explicit evaluations referring to left-handed intraatomic objects of uranium $U_{92}^{130}$ having the orbital structure in the eleventh section. This requires one to follow the logic of nature of leptonic strings $l\bar{\nu}_l$ in orbits of an odd ($N_{l\bar{\nu}_l}^o = 9, 11, 13, 15$) order. One can define from (262) the upper limits for the intrastring speeds of the right-handed antineutrinos

$$v_{\bar{\nu}_\epsilon \epsilon pnp} < 3.4548620 \cdot 10^{-7} \text{ m/s},$$

$$v_{\bar{\nu}_e epnp} < 1.2533056 \cdot 10^{-6} \text{ m/s},$$

$$v_{\bar{\nu}_\mu \mu pnp} < 5.4799170 \cdot 10^{-8} \text{ m/s},$$

$$v_{\bar{\nu}_\tau \tau pnp} < 3.5303936 \cdot 10^{-8} \text{ m/s}.$$

With the aid of (263) we find the radii of their orbits

$$r_{\bar{\nu}_\epsilon \epsilon pnp} < 3.2344404 \cdot 10^{-31} \text{ m},$$

$$r_{\bar{\nu}_e epnp} < 3.8708755 \cdot 10^{-29} \text{ m},$$

$$r_{\bar{\nu}_\mu \mu pnp} < 4.1865780 \cdot 10^{-24} \text{ m},$$

$$r_{\bar{\nu}_\tau \tau pnp} < 1.6964535 \cdot 10^{-22} \text{ m}.$$

The intrastring periods (264) have the limits

$$T_{\bar{\nu}_\epsilon \epsilon pnp} < 5.8823155 \cdot 10^{-24} \text{ s},$$

$$T_{\bar{\nu}_e epnp} < 1.9405822 \cdot 10^{-22} \text{ s},$$

$$T_{\bar{\nu}_\mu \mu pnp} < 4.8002635 \cdot 10^{-16} \text{ s},$$

$$T_{\bar{\nu}_\tau \tau pnp} < 3.0192473 \cdot 10^{-14} \text{ s}.$$

One can see from (265) the absolute energies

$$E_{\bar{\nu}_\epsilon \epsilon pnp} < 2.0900783 \cdot 10^{-7} \text{ eV},$$

$$E_{\bar{\nu}_e epnp} < 4.3662286 \cdot 10^{-4} \text{ eV},$$

$$E_{\bar{\nu}_\mu \mu pnp} < 1.2002794 \cdot 10^{-5} \text{ eV},$$

$$E_{\bar{\nu}_\tau \tau pnp} < 2.0430134 \cdot 10^{-5} \text{ eV}.$$

Now we look at the upper limits of (219)-(222) obtained for $U_{92}^{184}$, which jointly with the foregoing show that

$$v_{\bar{\nu}_l lpn} < v_{\bar{\nu}_l lpnp}, \quad r_{\bar{\nu}_l lpn} > r_{\bar{\nu}_l lpnp}, \tag{270}$$

$$T_{\bar{\nu}_l lpn} > T_{\bar{\nu}_l lpnp}, \quad E_{\bar{\nu}_l lpn} < E_{\bar{\nu}_l lpnp}. \tag{271}$$

As well as in uraniums $U_{92}^{184}$ and $U_{92}^{238}$, each leptonic string $l\bar{\nu}_l$ in $U_{92}^{130}$ must distinguish itself from others by the values of (266)-(269), from which $v_{l\bar{\nu}_l pnp}$ coincide with speeds

$$v_{\epsilon\bar{\nu}_\epsilon pnp} = 1.9369311 \cdot 10^{-5} \text{ m/s},$$

$$v_{e\bar{\nu}_e pnp} = 2.9284250 \cdot 10^{-7} \text{ m/s},$$

$$v_{\mu\bar{\nu}_\mu pnp} = 2.5415811 \cdot 10^{-8} \text{ m/s},$$

$$v_{\tau\bar{\nu}_\tau pnp} = 6.1444950 \cdot 10^{-9} \text{ m/s}.$$

In these speeds, analysis of radii $r_{l\bar{\nu}_l pnp}$ assumed that

$$r_{\epsilon\bar{\nu}_\epsilon pnp} = 1.5480391 \cdot 10^{-25} \text{ m},$$

$$r_{e\bar{\nu}_e pnp} = 1.6309793 \cdot 10^{-22} \text{ m},$$

$$r_{\mu\bar{\nu}_\mu pnp} = 2.2477208 \cdot 10^{-20} \text{ m},$$

$$r_{\tau\bar{\nu}_\tau pnp} = 3.8457223 \cdot 10^{-19} \text{ m}.$$

One can estimate on their basis the periods $T_{l\bar{\nu}_l pnp}$ and find that

$$T_{\epsilon\bar{\nu}_\epsilon pnp} = 5.0216634 \cdot 10^{-20} \text{ s},$$

$$T_{e\bar{\nu}_e pnp} = 3.6326857 \cdot 10^{-15} \text{ s},$$
$$T_{\mu\bar{\nu}_\mu pnp} = 5.5567169 \cdot 10^{-12} \text{ s},$$
$$T_{\tau\bar{\nu}_\tau pnp} = 3.9325259 \cdot 10^{-10} \text{ s}.$$

To them we must add the absolute energies $E_{l\bar{\nu}_l pnp}$ equal to

$$E_{\epsilon\bar{\nu}_\epsilon pnp} = 1.2353478 \cdot 10^{5} \text{ eV},$$
$$E_{e\bar{\nu}_e pnp} = 2.8461499 \text{ eV},$$
$$E_{\mu\bar{\nu}_\mu pnp} = 1.4909240 \cdot 10^{-3} \text{ eV},$$
$$E_{\tau\bar{\nu}_\tau pnp} = 2.1248556 \cdot 10^{-5} \text{ eV}.$$

It is also relevant to compare the foregoing with estimates (224)-(227) finding for $U_{92}^{184}$ at the same choice of a particle mass. This allows to establish the following inequalities:

$$v_{l\bar{\nu}_l pn} < v_{l\bar{\nu}_l pnp}, \quad r_{e\bar{\nu}_e pn} > r_{l\bar{\nu}_l pnp}, \tag{272}$$

$$T_{l\bar{\nu}_l pn} > T_{l\bar{\nu}_l pnp}, \quad E_{l\bar{\nu}_l pn} < E_{l\bar{\nu}_l pnp}. \tag{273}$$

Their existence similarly to ratios (270) and (271) will testify in favor of a role of excess antiprotons, and

$$v_{\bar{\nu}_l lpnp} < v_{l\bar{\nu}_l pnp}, \quad r_{\bar{\nu}_l lpnp} < r_{l\bar{\nu}_l pnp}, \tag{274}$$

$$T_{\bar{\nu}_l lpnp} < T_{l\bar{\nu}_l pnp}, \quad E_{\bar{\nu}_l lpnp} < E_{l\bar{\nu}_l pnp} \tag{275}$$

hold regardless of what is the spin or the isospin of a nucleus.

## 14. Orbit quantization law

Owing to a quantum nature of atomic system, to any type of the left (right)-handed lepton orbit of an odd (even) order corresponds a kind of radius. This principle expresses, in the case of $Fn_{92}^{92}$, the idea of antineutrino orbits of an odd order about that

$$r_{\bar{\nu}_\epsilon n} < r_{\bar{\nu}_e n} < r_{\bar{\nu}_\mu n} < r_{\bar{\nu}_\tau n}. \tag{276}$$

Such a correspondence is not changed even at the availability in atomic systems of a nucleus from antiprotons. An example for them may be an uranium $U_{92}^{92}$ in which the radii of lepton orbits of an odd order constitute a quantized succession

$$r_{\epsilon p} < r_{ep} < r_{\mu p} < r_{\tau p}. \tag{277}$$

If we now recall that a formation of $U_{92}^{184}$ at the interaction (179) between $Fn_{92}^{92}$ and $U_{92}^{92}$ is not forbidden by unification laws, from the point of view of each of them, it should be expected that the united regularity

$$r_{\epsilon\bar{\nu}_\epsilon pn} < r_{e\bar{\nu}_e pn} < r_{\mu\bar{\nu}_\mu pn} < r_{\tau\bar{\nu}_\tau pn} \tag{278}$$

appears in the presence in $U_{92}^{184}$ of boson orbits of an odd order.

At first sight, the difference in masses $m_l$ and $m_{\bar{\nu}_l}$ violates, in the case of $U_{92}^{238}$, an orbit quantized succession. On the other hand, our orbital analysis shows that

$$r_{\bar{\nu}_\epsilon pnn} < r_{\bar{\nu}_e pnn} < r_{\bar{\nu}_\mu pnn} < r_{\bar{\nu}_\tau pnn}, \quad r_{\epsilon\bar{\nu}_\epsilon pnn} < r_{e\bar{\nu}_e pnn} < r_{\mu\bar{\nu}_\mu pnn} < r_{\tau\bar{\nu}_\tau pnn}. \tag{279}$$

Finally, insofar as an uranium $U_{92}^{130}$ is concerned, we have already seen that

$$r_{\epsilon pnp} < r_{epnp} < r_{\mu pnp} < r_{\tau pnp}, \quad r_{\epsilon\bar{\nu}_\epsilon pnp} < r_{e\bar{\nu}_e pnp} < r_{\mu\bar{\nu}_\mu pnp} < r_{\tau\bar{\nu}_\tau pnp}. \tag{280}$$

Therefore, it is relevant to emphasize once more that neither of orbital particles in an atomic system does not contradict the symmetry laws. In other words, an atom has been created so that to any type of lepton orbit corresponds a kind of size of the action radius of an intraatomic unified force. At these situations, a force of an atomic unification becomes orbitally quantized. Thus, orbit quantization cannot carry out around the nucleus regardless of the family structure of leptons. On this basis, nature itself has quantized an intraatomic united force of the interaction between the nucleus and its orbital fermion in the flavor type dependence.

## 15. Conclusion

An intraatomic feature of the two types of symmetries of the flavor and baryon nature is a simultaneous violation or a coexistence or both. Atoms of the first case have a nucleus consisting of neutrons or antiprotons. To the second case refer the atomic systems with nuclei of the same quantity of neutrons and antiprotons. An example for the third case may be atoms with neutron or antiproton excess nuclei.

An important general picture of these atomic systems is that their construction is based at first on the existence in nature of $Fn_1^1$ and $H_1^1$ at the summed baryon and lepton number conservation. Thus, if a force of an atomic unification relates the flavor and baryon symmetries as a consequence of the neutrality of an atom, a formation of an orbit quantized succession around the nucleus must be considered as an orbital quantization not only of a force but also of each of mass and charge.

It is already clear from these connections that orbit quantization of any atomic system unites all intraatomic symmetry laws in a unified whole. Thereby, it reflects a crucial role of $Fn_1^1$ and $H_1^1$ in construction of each of the remaining forms of atoms. Therefore, it is important to elucidate what is the radius of their single orbit including the speed, energy and rotation period of its particle. For this first of all, one must mention about the sizes of (169)-(172), which have at $N_n = N_{\bar{\nu}_\epsilon}$ the following limits:

$$v_{\bar{\nu}_\epsilon n} < 1.4928839 \cdot 10^2 \text{ m/s},$$

$$r_{\bar{\nu}_\epsilon n} < 5.0162382 \cdot 10^{-42} \text{ m},$$

$$T_{\bar{\nu}_\epsilon n} < 2.1112126 \cdot 10^{-43} \text{ s},$$

$$E_{\bar{\nu}_\epsilon n} < 1.5147019 \cdot 10^{15} \text{ eV}.$$

Supposing in (174)-(177) that $N_p = N_\epsilon$, we find for their explicit values

$$v_{\epsilon p} = 6.6671897 \cdot 10^{-5} \text{ m/s},$$

$$r_{\epsilon p} = 2.5115763 \cdot 10^{-29} \text{ m},$$

$$T_{\epsilon p} = 2.3669191 \cdot 10^{-24} \text{ s},$$

$$E_{\epsilon p} = 3.0169111 \cdot 10^2 \text{ eV}.$$

This circumstance requires one to recall the presence in (169)-(172) and (232)-(235) of mass and number of protons, and in (174)-(177) and (237)-(240) of mass and number of antineutrons, describing the fact that all structural sizes having a generality for atomic systems $Fn_N^A(\bar{F}n_N^A)$ and $\bar{X}_Z^A(X_Z^A)$ are responsible for their periodical interconversions in which appear again a compatibility of (126), (130), (141), (146), (181), (186), (196) and (201) with ideas of symmetry laws and an incompatibility with them of each of

$$Fn_N^A \leftrightarrow \bar{F}n_N^A, \quad X_Z^A \leftrightarrow \bar{X}_Z^A. \tag{281}$$

We now remark that well known laboratory data [33] confirm the existence of 15 more new forms of atoms extending (95) and (96) to

$$9, \quad 18, \quad 27, \quad ..., \quad 927, \quad ..., \quad 1062, \quad ..., \tag{282}$$

$$1, \quad 2, \quad 3, ..., \quad 103, \quad ..., \quad 118, \quad .... \tag{283}$$

Then it is possible, for example, the sum of the first 118 terms of a progression (282) predicts the availability in nature of 63189 types of isotopes of 118 forms of atomic systems.

Among these objects an uranium family includes 738 types of atoms. Of them $U_{92}^{236}$ similarly to all other neutron excess uraniums is constituted through an atomic unification

$$Fn_1^1 + U_{92}^{235} \rightarrow U_{92}^{236}. \tag{284}$$

Its decay is carried out by a principle that

$$U_{92}^{236} \rightarrow Kr_{36}^{92} + Ba_{56}^{141} + Fn_3^3. \tag{285}$$

It is here that we must for the first time use the energy of an atomic origination, emphasizing that it coming forward at first as the isotropic flux of the same antineutrino hydrogens $Fn_1^1$ from the decay of an atom $Fn_3^3$ of a lithium family

$$Fn_3^3 \rightarrow Fn_1^1 + Fn_1^1 + Fn_1^1 \tag{286}$$

and, next, as the anisotropic flux of the two types of objects from the decay

$$Fn_1^1 \rightarrow \bar{\nu}_{\epsilon L,R} + n_{L,R}^- \tag{287}$$

becomes in (285) powerful tool for new measurements owing to full energy of an antineutrino depending on the force of unification of the same atomic system where it was an orbital fermion.

If, in spite of these connections, the spontaneous structural change of uranium $U_{92}^{236}$ has successively constituted any of both types of fluxes, this implies simply that each antineutrino is trying to show us something nonsimple that nobody is in force to exclude the availability in an incoming astronomical object of such an energy, which was strictly a latent only in its first-initial lost orbit.

Thus, the previously orbital antineutrinos express the part of a general picture of the universe in which it is definitely predicted that a formation of the solar system is in whole based on the construction of an atomic one but not vice versa.

The similarity and difference in nature of these two forms of the same object will expound in our further works. But here we have already mentioned that the solar system was at first an atomic one.

## References


1. E. Rutherford, Phil. Mag. **21,** 669 (1911).

2. R.S. Sharafiddinov, Spacetime Subst. **3**, 47 (2002); Bull. Am. Phys. Soc. **59,** T1.00009 (2014); arXiv:physics/0305008.
3. R.S. Sharafiddinov, Bull. Am. Phys. Soc. **60**, E13.00008 (2015); arXiv:hep-ph/0409254.
4. N. Bohr, Phil. Mag. **26**, 1 (1913).
5. J. Stark, Ann. Phys. **43**, 965 (1914).
6. P. Zeeman, Researches in Magneto-optics, London, 1913.
7. O. Klein, Nature **161**, 897 (1948).
8. E. Clementel and G. Puppi, Nuovo Cimento **5**, 505 (1948).
9. J. Tiomno and J. Wheeler, Rev. Mod. Phys. **21**, 144 (1949).
10. T.D. Lee, M.H. Rosenbluth and C.N. Yang, Phys. Rev. **75**, 905 (1949).
11. R.S. Sharafiddinov, Eur. Phys. J. Plus **126**, 40 (2011)); arXiv:0802.3736 [physics.gen-ph].
12. Ya.B. Zel'dovich. Dokl. Akad. Nauk SSSR. **91**, 1317 (1953).
13. E.J. Konopinski and H. Mahmoud. Phys. Rev. **92**, 1045 (1953).
14. R.S. Sharafiddinov, Phys. Essays **30**, 150 (2017); Bull. Am. Phys. Soc. **59**, Y12.00006 (2014); arXiv:1203.3987 [physics.gen-ph].
15. R.S. Sharafiddinov, Can. J. Phys. **92**, 1262 (2014); Bull. Am. Phys. Soc. **57**, MB.00003 (2012); arXiv:0807.3805 [physics.gen-ph].
16. G.G. Raffelt, Phys. Rep. **320**, 319 (1999).
17. R.S. Sharafiddinov, Int. J. Theor. Phys. **55**, 3040 (2016); Bull. Am. Phys. Soc. **57**, KA.00069 (2012); arXiv:1004.0997 [hep-ph].
18. R.S. Sharafiddinov, in *Proceedings of the April Meeting of the American Physical Society, Dallas, Texas, April 22-25, 2006*, Abstract, H12.00009; arXiv:hep-ph/0511065.
19. Ya.B. Zel'dovich, Dokl. Akad. Nauk SSSR. **86**, 505 (1952).
20. Particle Data Group, *Review of Particle Properties*, Phys. Rev. **D 45** (1992).
21. R.S. Sharafiddinov, Can. J. Phys. **93**, 1005 (2015); Bull. Am. Phys. Soc. **59**(18), EC.00001 (2014); arXiv:1409.2397 [physics.gen-ph].
22. M. Goldhaber, L. Grodzins and A.W. Sunyar, Phys. Rev. **106**, 826 (1957).
23. M. Goldhaber, L. Grodzins and A.W. Sunyar, Phys. Rev. **109**, 1015 (1958).
24. H. Überall, Nuovo. Cim. **6**, 376 (1957).
25. R.S. Sharafiddinov, Phys. Essays **29**, 410 (2016); Bull. Am. Phys. Soc. **59**, EC.00007 (2014); arXiv:1703.06030 [physics.gen-ph].
26. G. Audi, O. Bersillon, J. Blachot and A. H. Wapstra, Nucl. Phys. **A 729**, 3 (2003).

27. G. Audi, A.H. Wapstra, and C. Thibault, Nucl. Phys. **A 729**, 337 (2003).

28. R.S. Sharafiddinov, Spacetime Subst. **3**, 47 (2002); Bull. Am. Phys. Soc. **59**, T1.00009 (2014); arXiv:physics/0305008.

29. J. Milnor, Am. Math. Month. **90**, 353 (1993).

30. H. Abelson, A. diSessa and L. Rudolph, Am. J. Phys. **43**, 579 (1975).

31. E.J. Aiton, Ann. Sci. **20**, 81 (1964).

32. E.J. Aiton, Ann. Sci. **20**, 111 (1964).