Mass Spectrum in General Models

Pastushenko Vladimir Alexandrovich

Abstract

Within the framework of the technology of axioms of dynamic space-matter, it is possible to calculate the mass spectrum of elementary particles and the spectrum of atomic models in a single mathematical truth. (viXra:2010.0069)

Each mathematical model that answers the HOW question has its own reasons for internal connections. Lagrangian mechanics can only be applied to systems whose constraints, if any, are all holonomic. In quantum mechanics, where waves are particles with nonholonomic constraints, in the fields of a single space-matter, Lagrange's formalism is impossible, neither in fact, nor by definition. Through transformations it is always possible to arrive at a different model of a physical fact, but with different reasons and in different connections. Both models are mathematical, but the question is, where is the truth? For example, (+) charge of a proton in quarks and (+) charge of a positron without quarks. This is a fundamental contradiction. Both models work, but the physical reasons are lost. There is no answer to the question WHY so? The Feynman diagrams work, but the proton does not emit a photon, charged interacting with the electron of the atom. After all, these are the fundamental foundations of all atomic structures, the structure of matter. WHY so - there is no answer. Here we will answer the question WHY a particle has exactly such decay or annihilation products of indivisible quanta. We will proceed from the general representations $\psi(X) = e^{a(X)}\overline{\psi}(X)$ of the Dirac equation when $Y = e^{a(X)}(X+)$ the dynamic quantum field $(X\pm) = ch\left(\frac{X}{Y_o}\right)(X+)cos\varphi(X-) = 1$, $s\varphi(X-) = \sqrt{G}$, or $(Y\pm) = ch\left(\frac{Y}{X_o}\right)(Y+)cos\varphi(Y-) = 1$, $cos\varphi(Y-) = \frac{1}{137.036} = \alpha$, Where $(cos\varphi \neq 0)$ in both cases. In mass fields $m(Y- = X+)$, we will take the measured mass and the calculated time (T) of particle decay. From the most general representations: $m = \frac{\Pi^2}{Y''} = \frac{\Pi^2 T^2}{Y=\exp(z)} = T\Pi(\frac{K}{T})(\frac{K}{\mp})\mp\exp(-z)$, with a unit charge $(X- = Y+) = 1$, and the speed of light $c = 1$, in the quantum itself, space-matter $m = T\frac{(\Pi K=q=1)}{G\alpha}(\frac{K}{T} = c = 1)\exp(-z)$, $z = \frac{(m_X=\Pi X)}{\Pi=c^2=1)} = X(MeV)$, and $z = \frac{(m_Y=\Pi Y)}{\Pi=c^2=1)} = Y(MeV)$ in the dynamic, hyperbolic $e^{a(X)}$ space of the Dirac equation.

For $G = 6{,}67 * 10^{-8}$, $\alpha = \frac{1}{137.036}$, $\nu_\mu = 0{,}27\ MeV$, $\gamma_o = 3{,}13 * 10^{-5} MeV$, $\nu_e = 1{,}36 * 10^{-5} MeV$, $\gamma = 9{,}1 * 10^{-9} MeV$

Mass spectrum in accordance with decay products (annihilation).

Stable particles with annihilation products in a single $(Y\mp = X\pm)$ space-matter:

$(X\pm = p) = (Y- = \gamma_o)(X+ = \nu_e)(Y- = \gamma_o) = \left(\frac{2\gamma_o}{G} - \frac{\nu_e}{\alpha^2}\right) = 938{,}275\ MeV$;

$(Y\pm = e) = (X- = \nu_e)(Y+ = \gamma)(X- = \nu_e) = \left(\frac{2\nu_e}{\alpha^2} - \frac{\gamma\alpha}{2G}\right) = 0{,}511\ MeV$;

Unstable particles are already in accordance with the products and decay time. . $G\alpha = 4.8673 * 10^{-10}$,

$(Y\pm = \mu) = (X- = \nu_\mu)(Y+ = e)(X- = \nu_e) = \frac{(T=2.176*10^{-6})}{G\alpha}\exp\left(\nu_\mu + e + \frac{\nu_e ch1}{\alpha^2} = 1{,}1751\right) = 105{,}66\ MeV$,

Let us denote here and below in the calculations by the underlined font, $(\underline{\mu} = 1{,}1751)$ the exponent exp(). It shows the features of the fragmentation of the dynamic field exp (a (X)), in the Dirac equation.

$(Y\pm = \pi^\pm) = (Y+ = \mu)(X- = \nu_\mu) = \frac{(T=2.76586*10^{-8})}{2G\alpha}\exp\left(\underline{\mu} + \nu_\mu ch1\right) = 139{,}57\ MeV$, $(\underline{\pi^\pm} = 1{,}59173)$

$(X- = \pi^0) = (Y+ = \gamma_o)(Y+ = \gamma_o) = \frac{(T=7.8233*10^{-17})}{G^2\alpha}\exp\left(\frac{2\gamma_0^2}{G\alpha}\right) = 134{,}98\ MeV$, $(\underline{\pi^0} = 4{,}025599)$

$(X- = \eta^0) = (X+ = \pi^0)(Y-)(X+ = \pi^0)(Y-)(X+ = \pi^0) = \frac{(T=5.172*10^{-19})}{(G\alpha)^2}\exp\left(\frac{3\underline{\pi^0}}{2} - \frac{\gamma ch2}{G}\right) = 547{,}853\ MeV$,

$(X- = \eta^0) = (Y- = \pi^+)(X+ = \pi^0)(Y- = \pi^+) = \frac{(T=5.1*10^{-19})}{\sqrt{2}(G\alpha)^2}\exp\left(2\underline{\pi^\pm} + \frac{\underline{\pi^0}}{2}\right) = 547{,}853\ MeV$,

$(Y\pm = K^+) = (Y+ = \mu)(X- = \nu_\mu) = \frac{(T=1.335*10^{-8})}{G\alpha}\exp 2\left(\underline{\mu} + \nu_\mu\right) = 493{,}67\ MeV$,

$(Y\pm = K^+) = (Y+ = \pi^+)(X- = \pi^0) = \frac{(T=1.01398*10^{-8})}{G\alpha}\exp\left(\underline{\pi^+ + \pi^0/2}\right) = 493{,}67\ MeV$. $\underline{K^-} = 3{,}16535$

$(Y- = K_S^0) = (X+ = \pi^0)(X+ = \pi^0) = \frac{(T=0{,}885*10^{-10})}{G\alpha}\exp\left(2\underline{\pi^0} - \frac{\gamma}{G}\right) = 497{,}67\ MeV$,

$(X- = K_L^0) = (Y- = \pi^\pm)(X+ = \nu_e)(Y- = e^\mp) = \frac{(T=4{,}9296*10^{-8})}{G\alpha}\exp\left(\underline{\pi^\pm} + e^\mp + \frac{2\nu_e}{\alpha^2}\right) = 497{,}67\ MeV$,

$(X- = K_L^0) = (Y- = \pi^\pm)(X+ = \nu_\mu)(Y- = \mu^\mp) = \frac{(T=5{,}1713*10^{-8})}{G\alpha}\exp\left(\underline{\pi^\pm} - \frac{\underline{\mu^\mp}}{2} + 2\nu_\mu\right) = 497{,}67\ MeV$,

$(X- = \rho^0) = (Y+ = \pi^+)(Y+ = \pi^+) = \frac{(T=5{,}02*10^{-24})}{G\alpha}\exp\left(\frac{2\underline{\pi^\pm}}{\sqrt{\alpha}}(1 + \frac{1}{2\sqrt{\alpha}}\right) = 775{,}49\ MeV$;

$(X\pm = \rho^+) = (X+ = \pi^0)(Y- = \pi^+) = \frac{(T=6{,}47566*10^{-24})}{G\alpha}\exp\left(\frac{\underline{\pi^0}}{\sqrt{\alpha}} - \frac{\underline{\pi^+(\sqrt{\alpha}-1)}}{2}\right) = 775{,}4\ MeV$;

Similarly hadrons

$(Y\pm = n) = (X- = \nu_e)(Y+ = e)(X- = p) = (T = 878{,}77)\exp\left(\frac{\nu_e}{\sqrt{G}} + \frac{e}{2} - p\sqrt{G}\right) = 938{,}57\ MeV$,

$(X\pm = \Lambda^0) = (X+ = p^+)(Y- = \pi^-) = \frac{(T=2.604*10^{-10})}{G\alpha}\exp\left(\alpha p^+ + \underline{\pi^-}/2\right) = 1115{,}68\ MeV$, $\underline{\Lambda^0} = 7{,}642837$

$(Y\pm=\Lambda^0)=(Y+=n)(X-=\pi^0)=\frac{(T=1.5625*10^{-10})}{G\alpha}\exp\left(\alpha n+\frac{\pi^0}{2ch1}\right)=1115{,}68\ MeV, \underline{\Lambda}^0=8{,}153$

$(Y-=\Sigma^+)=(X+=p^+)(X+=\pi^0)=\frac{(T=8.22*10^{-11})}{G\alpha}\exp\left(\alpha p^+ +\frac{\pi^0}{2}\right)=1189{,}37\ MeV$,

$(X-=\Sigma^+)=(Y+=n)(Y+=\pi^+)=\frac{(T=8.1*10^{-11})}{G\alpha ch1}\exp(\alpha n+\pi^+)=1189{,}37\ MeV$,

$(X-=\Sigma^-)=(Y+=n)(Y+=\pi^-)=\frac{(T=1.25*10^{-10})}{G\alpha}\exp(\alpha n+\pi^+)=1189{,}37\ MeV$,

$(X-=\Sigma^0)=(Y+=\Lambda^0)(Y+=\gamma)=\frac{(T=7.4*10^{-20})}{G^2\alpha*ch1}\exp\left(\frac{\Lambda^0+\gamma/G}{2}\right)=1192{,}64\ MeV$, $\underline{\Lambda}^0=7{,}642837$,

$(Y\pm=\Xi^0)=(Y+=\Lambda^0)(X-=\pi^0)=\frac{(T=2.5984*10^{-10})}{G\alpha}\exp(\underline{\Lambda}^0-\underline{\pi}^0\sqrt{\alpha})=1314{,}86\ MeV$, $\underline{\Lambda}^0=8{,}153$, $\underline{\Xi}^0=7{,}809$,

$(X\pm=\Xi^-)=(X+=\Lambda^0)(Y-=\pi^-)=\frac{(T=1.3917*10^{-10})}{G\alpha}\exp(\underline{\Lambda}^0+\underline{\pi}^-/2)=1321{,}71\ MeV$, $\underline{\Lambda}^0=7{,}642837$, $\underline{\Xi}^-=8{,}43869$,

$(X-=\Omega^-)=(Y+=\Lambda^0)(Y+=K^-)=\frac{(T=8.018*10^{-11})}{G\alpha}\exp(\underline{\Lambda}^0-\underline{K}^-/2)=1672{,}45\ MeV$, $\underline{\Lambda}^0=7{,}642837$, $\underline{K}^-=3{,}16535$

$(X-=\Omega^-)=(Y+=\Xi^0)(Y+=\pi^-)=\frac{(T=6.734*10^{-11})}{G\alpha}\exp(\underline{\Xi}^0+\underline{\pi}^-)=1672{,}45\ MeV$, $\underline{\Xi}^0=7{,}809$,

$(Y-=\Omega^-)=(X+=\Xi^-)(X+=\pi^0)=\frac{(T=7.1147*10^{-11})}{G\alpha}\exp(\underline{\Xi}^-+\underline{\pi}^0/ch2)=1672{,}45\ MeV$, $\underline{\Xi}^-=8{,}275$,

There are other methods for calculating the mass spectrum, but this logical construction gives the calculation of the mass spectrum with minimal parameters. The initial parameters here are only decay products. This model is still imperfect, but without the shortcomings and contradictions of the Standard Model.

In other methods of calculating the mass spectrum, we are talking about a different technology of theories themselves, in which Bohr's postulates, the uncertainty principle, the principle of mass equivalence, are presented as axioms of dynamic space-matter. There are other initial concepts and on their basis, other causes and effects in the models. The same mass spectrum is calculated in quantum models. For example, in the quantum relativistic dynamics of the "gauge field", a dynamic mass is formed in the form: $\overline{W}=\frac{a_{11}W_Y\pm c}{a_{22}\pm W_Y/c}$, at the extreme point, $(\pm K_Y)^2=0=\frac{\Pi^2}{b^2}-\Pi*\overline{T}^2$, $\Pi_1=0$, $\Pi_2=b^2*\overline{T}^2$, with the proper space of velocities in the Spontaneous Breaking of Symmetry, $W_Y{}^2=\frac{\Pi}{2}=\frac{b^2*\overline{T}^2}{2}$, or

$$\overline{W}=\frac{\overline{T}}{\sqrt{2}}\left(\pm b=\frac{\Pi^2=F_Y}{\overline{m}}\right),\qquad \overline{m}*W_Y=\frac{1}{\sqrt{2}}(\pm F_Y\overline{T}=\pm p_Y),\qquad \overline{m}*W_Y=\frac{\pm p_Y}{\sqrt{2}},\qquad \overline{m}=\frac{p_Y}{W_Y\sqrt{2}}.$$

For mass $(Y-=X+)$ fields, under the conditions of Global (GI) and Local Invariance (LI), we obtain:

$$\overline{K}_Y=(a_{11}=cos\gamma)_{\text{ГИ}}K(ch\frac{X}{Y_0}cos\varphi_X)_{\text{ЛИ}}(X+)+K_X(X-)\text{ , или}$$

$$(\Pi\overline{K}_Y=\overline{m})=(a_{11}=cos\gamma)_{\text{GI}}\left(\frac{\overline{m}=m_0}{\sqrt{2}}\right)\left(\left(ch\frac{X}{Y_0}=1\right)/ch\frac{Y}{X_0})cos\varphi_X\right)_{\text{LI}}(X+=Y-)+(\Pi K_X=m_0)(X-)\ .$$

Symmetries of such mass $(X+=Y-)$ trajectories at levels of n- convergence under the conditions $ch\frac{Y}{X_0}cos\varphi_X=1$, quantum relativistic corrections $(1-(\alpha=W/c=1/137)^2)=(1+\alpha)(X+)(1-\alpha)(X-)$ by levels, forming a new and new stage of n- convergence, and in the most general form - dynamic mass:

$$\overline{m}=\left(\left[\left\{\frac{m_0}{\sqrt{2}ch2}=\overline{m}_1\right\}(1+\alpha)=\overline{m}_2\right](1+\alpha)=\overline{m}_3\right)(X+)+m_0(X-).$$

in the quantum field of the Dirac equation, already without the scalar boson. For example,

for: $m_0=m_p=938{,}279MeV$,

$\overline{m}=\left\{\frac{m_p}{\sqrt{2}ch2}=\overline{m}_1\right\}\left(\alpha=\frac{1}{137.036}\right)(X+)+m_p(X-)=939.57\ MeV=m_n$,

$\overline{m}=\left\{\frac{m_p}{\sqrt{2}ch2}=(\overline{\pi}^0)\right\}(X+)+m_n(X-)=(\Lambda^0=1115.9\ MeV)$, $\overline{\pi}^0=176{,}35\ MeV$,

$\overline{m}=[\left\{\frac{m_p}{\sqrt{2}ch2}=\overline{m}_1\right\}(1+\alpha)=\overline{\pi}^0(1+\alpha)=\overline{m}_2=\overline{\pi}^-](X+)+m_p(X-)=(\Lambda^0=1115.9\ MeV)$, $\pi^-=177{,}637\ MeV$

With relativistic masses of π-mesons, with velocities $(W=0{,}64*c)$ in quantum relativistic dynamics.

Similarly further:

$\Sigma^+(p^+,\pi^0)=\sqrt{2}*\overline{\pi}^0(1+\alpha)(X+)+m_p(X-)=1189{,}5\ (1189{,}64)MeV$,

$\Sigma^-(n,\pi^-)=\sqrt{2}*\overline{\pi}^-(1+\alpha ch2)(X+)+m_n(X-)=1197{,}68\ (1197{,}3)MeV$,

$\Sigma^0\left(\Lambda^0,\gamma\right)=\sqrt{2}*\overline{\pi}^0(1+\alpha)^2(X+)+m_n(X-)=1192{,}6\ MeV$, $\Lambda^0=\Lambda^0(n,\pi^0)$,

$\Xi^0\left(\pi^0,\Lambda^0(n,\pi^0)\right)=\left[2\overline{\pi}^0(1+\alpha)^2(1+2\alpha ch2)\right](X+)+m_p(X-)=1315{,}8MeV$ **

$\Xi^-\left(\pi^-,\Lambda^0(p,\pi^-)\right)=[2\overline{\pi}^-(1+2\sqrt{2}\alpha ch2)](X+)+m_p(X-)=1321{,}14MeV$,

$\Omega^-(\Xi^0,\pi^-)(\Xi^-,\pi^0)=\left[\frac{ch2}{\sqrt{2}}(\overline{\pi}^0(1+\alpha)^2)ch1\right](X+)+m_p(X-)=1672{,}8\ MeV$,

$\Lambda_C^+=\left[2(\frac{m_p}{\sqrt{2}}=\overline{\pi}^0ch2)(1+\alpha)^2(X+)+m_p(X-)\right]=\left[2ch2(\overline{\pi}^0(1+\alpha)=\overline{\pi}^-)(1+\alpha)(X+)+m_p(X-)\right]=2284{,}6MeV$

We denote the constant $(1 + (ch2)^2(\alpha)^2) = S = 1{,}10328758$, the relativistic mass $(m_0 = 2797{,}53375\, MeV)$ and rewrite the formula as: $\overline{m} = \left(\left(\left((m_0 S = \overline{m}_1)S = \overline{m}_2\right)S = \overline{m}_3\right)S = \overline{m}_4\right) + \frac{1}{2} m_0 \alpha$, then

for charmonium levels:

$\overline{m} = (\overline{m}_1 = 3086{,}48 MeV) + \left(\frac{1}{2} m_0 \alpha = 10{,}2\, MeV\right) = 3096{,}68 MeV = j/\psi$, $(3096{,}7 MeV)$ valid,

$\overline{m} = (\overline{m}_2 = 3405{,}275 MeV) + \left(\frac{1}{2} m_0 \alpha = 10{,}2\, MeV\right) = 3415{,}475 MeV = \chi_0$, $(3415\, MeV)$,

$\overline{m} = \chi_0(1 + \alpha * ch2) = 3509{,}27 MeV = \chi_1$, $(3510\, MeV)$,

$\overline{m} = \left(\frac{m_1}{(1+\alpha * ch2)^2} = 2923{,}74 MeV\right) + (2 m_0 \alpha = 40829 MeV) = 2964{,}6 MeV = \eta_C$, $(2980\, MeV)$,

Similarly, the mass fields $(Y- = m_e)$ of the electron, $\overline{m} = \frac{m_e}{(cos\varphi = \sqrt{G/2})} = m_0 = 2798.16\, MeV$ give:

$\overline{m} = \frac{2 m_0}{(ch2)^3}\left(1 + \frac{\alpha}{\sqrt{2}}\right) = 105{,}6\, MeV$, muon, and further mesons:

$\overline{m} = \frac{m_0}{\sqrt{2}(ch2)^2} = 139{,}78\, MeV = \pi^{\pm}$, $\overline{m} = \frac{m_0}{\sqrt{2}(ch2)^2}(1 - \sqrt{2} * \alpha * ch2) = 134{,}3\, MeV = \pi^0$,

$\overline{m} = \left(\frac{m_0}{4\sqrt{2}} = m_1\right) * \left(1 + \frac{\alpha}{\sqrt{2}}\right) = 497{,}2\, MeV = K^0$, $\overline{m} = (m_1)/\left(1 + \frac{\alpha}{2\sqrt{2}}\right) = 493{,}4\, MeV = K^{\pm}$,

Such a calculation technology, in the conditions $(X\pm = Y \mp)$ and $(\varphi \neq const)$ dynamic space, in the Euclidean axiomatics $(\varphi = const)$ and without $(X\pm = Y \mp)$ fields, is impossible in principle. We are talking about a different technology of the theories themselves. Just as it is impossible to represent the quantum relativistic dynamics of the Quantum Theory of Relativity in Euclidean axiomatics $(\varphi = 0 = const)$. This is impossible in principle.

The combined equations assume the presence of closed $rot_x H(X-)$ (vortex) in the shells of magnetic fields $(X- = p^+)$ protons in quanta $(Y- = p/n)$ and vortex $rot_Y N(Y-)$ mass $(Y-)$ trajectories of exchange quanta of mesons, their quark models. These are the fields of strong interaction of nucleons in their electro $(Y+ = X-)$ magnetic (charge) and gravitational $(X+ = Y-)$mass interaction. Different structures of decay products of elementary particles give different generations of quarks $(Y- = u)(X+ = d)$ as models. Here to quantum$(Y- = p/n)$, $(Y- = 2n)$ Strong Interaction of nucleons $(p \approx n)$ of a core. Since the field density $(\frac{\partial B(X-)}{\partial T})$ of the neutrino trajectory $\rho(X- = \nu_e)$ is much greater than the field density of the proton trajectory $\rho(X- = p)$, then in the quanta of the Strong interaction of nucleons $(p \approx n)$ of the nucleus with the neutron decay products

$(Y\pm = n) = (X = d)(Y = u)(X = d) = (\boldsymbol{X} - = \boldsymbol{p}^+)(\boldsymbol{Y} + = e^-)(\boldsymbol{X} - = \nu_e^-)$, and

proton annihilation $(X\pm = p^+) = (Y = u)(X = d)(Y = u) = (\boldsymbol{Y} - = \gamma_0^+)(\boldsymbol{X} + = \nu_e^-)(\boldsymbol{Y} - = \gamma_0^+)$

the protons are "bound" by the "rigid string" of the vortex magnetic field of the trajectory $(X- = \nu_e)$ of the neutrino as the reason for the stability of such quanta of strong interaction in the nuclei of atoms. In this case, we have $\big(Y-) = (X+)(X+)\big) = cos\varphi_Y * 2p = 2\alpha * p = (Y- = p/n)$ quanta of strong interaction. Hence follows the relation: $2\alpha * p = \Delta m(Y-) = 13{,}69\, MeV$ .There corresponds the equation:

$$G(X+) = \psi \frac{\hbar \lambda}{\Delta m^2} G \frac{\partial}{\partial t} grad_n R g_{ik}(X+) \ .$$

We have quanta $(Y- = p/n)$ of strong interaction in nuclei with a minimum $\Delta E_N = 6{,}85\, MeV$ and a maximum specific binding energy $\Delta E_N \approx 8{,}5\, MeV$ or $\Delta m(Y-) = 17\, MeV$, nucleons kernels. By analogy with the electron bremsstrahlung $(Y- = e^-) \rightarrow (Y- = \gamma^+)$, X-rays, there is emission of quanta of "dark matter" $\left(Y- = \alpha\left[\left(\frac{p^+}{n}\right) \text{или} (2n)\right] = e_+^*\right) \rightarrow (Y- = (14 - 17)\, MeV = \gamma_-^*)$, with mass $(Y-)$ trajectories. They have a charge field $(Y+)$ and can react to a magnetic field. We are talking about bremsstrahlung from the nucleus ${}_1^2H$ of deuterium. Such quanta of "dark matter" are absorbed by quanta $(Y- = p / n)$ of the shells of the atomic nucleus. Similar quanta of "dark matter" give the nuclei of planets $(Y- = 223{,}36 GeV)$, stars $(Y- = 4{,}3 * 10^6 GeV)$, "black holes" $(Y- = 1{,}5 * 10^7 TeV)$ and galactic nuclei $(Y- = 2{,}48 * 10^{11} TeV)$.

In uniform $(Y- = X+)$quantum space-matter of a kernel, there are density equations $\left[\frac{1}{T^2}\right]$, gravity $(X+ = Y-)$ mass, and electro $(Y+ = X-)$magnetic field, and in the nuclei of atoms too.

$$\frac{1}{r} G(X+) = c * rot_Y M(Y-) - \varepsilon_2 \frac{\partial G(X+)}{\partial t}, \quad \text{and} \quad \frac{1}{r} E(X+) = c * rot_X B(X-) - \varepsilon_2 \frac{\partial E(X+)}{\partial t}.$$

Such equations of quantum fields are considered in each specific case. In the general case, $(Y\pm = \frac{p}{n} = {}_1^2H)$ and $(X\pm = 2\frac{p}{n} = {}_2^4\alpha)$ of nuclear shells form levels and shells of electrons in the spectrum of atoms.

In unified models of decay products of the mass spectrum of elementary particles, in unified fields $(Y- = X+)$, $(Y+ = X-)$ of space-matter, it is possible to represent the nuclei of the atomic spectrum. For example, in structures $(Y- = p/n)$ or $(Y- = 2n)$ quanta of Strong Interaction, except for nuclei $(Y\pm = \frac{p}{n} = {}_1^2H)$ и $(X\pm = 2\frac{p}{n} = {}_2^4\alpha)$, take place here $(Y- = {}_0^1n)(X+ = {}_1^1H)(Y- = {}_0^1n) = (X\pm = {}_1^3H)$, $(X+ = {}_1^3H)(X+ = {}_2^4H) = (Y- = {}_3^7Li)$, and so on. $(X- = {}_2^4\alpha)(Y+ = {}_0^1n)(X- = {}_2^4\alpha) = (Y- = {}_4^9Be)$,

$(X+={}_{2}^{4}\alpha)(Y-)(X+={}_{2}^{4}\alpha)(Y-)(X+={}_{2}^{4}\alpha)=(X+={}_{6}^{12}C)$,
$(X+={}_{2}^{4}\alpha)(Y-)(X+={}_{2}^{4}\alpha)(Y-={}_{1}^{2}H)(X+={}_{2}^{4}\alpha)=(X+={}_{7}^{14}N)$.
New structure $(X+={}_{2}^{4}\alpha)(X+={}_{2}^{4}\alpha)=({}_{4}^{8}Y-)$ in new cores: $({}_{4}^{8}Y+)({}_{4}^{8}Y+)=(X-={}_{8}^{16}O)$, $(Y-={}_{4}^{8}Y+)(X+={}_{1}^{3}H)(Y-={}_{4}^{8}Y+)=(\pm={}_{9}^{19}F)$, and so on We will distinguish $(Y-=p/n={}_{1}^{2}H)$ charged and neutral $(Y-=2n)$ quanta of strong nuclear interaction. Inside the shells of the structural forms of charged $(Y-=p/n)$ quanta of the Strong interaction, in heavier nuclei there are independent structures of neutral $(Y-=2n)$ quanta of the Strong interaction. These structures of charged $(Y-=p/n)$ and neutral $(Y-=2n)$ quanta of Strong interaction intertwine in the corresponding shells of closed vortex fields. For example, a neutral structural form $(Y\pm=2n)(Y\pm=2n)=(X\mp=4n)$, is inside the kernel $(X\pm={}_{18}^{40}Ar(X\pm=(4n=2n+2n))$. Similarly below: $(X\pm={}_{23}^{51}V(5n))$, $(X\pm={}_{25}^{55}Mn(5n))$, $(X\pm={}_{27}^{59}Co(5n))$, $(X\pm={}_{33}^{75}As(Y\pm=(9n=4n+n+4n))$, on (n) convergence of axioms up to the limiting 100% state of the nucleus: ${}_{83}^{209}Bi(43n)$, in the model:

$$(X\mp=4n)(Y\pm=9n)(X\mp=4n)(Y\pm=9n)(X\mp=4n)(Y\pm=9n)(X\mp=4n)=43n$$

Such neutral structures are located in the corresponding shells of structures of charged quanta of Strong interaction in self-consistent fields, closed in a figure of eight, a chain of vortex fields. All this corresponds to the equations of dynamics, amenable to modeling, calculations and forecasts.
Saturating these quanta $(Y\pm)$, $(X\pm)$ of nuclear shells with the energy of quanta of "dark matter" $(Y-=14-17)\,MeV$, it is possible to cause "ionization" of nuclear shells. In such artificial radioactivity, it is possible, for example, from the nuclei of atoms $({}_{80}Hg-{}_{1}^{2}H)$ or $({}_{81}Tl-{}_{2}^{4}He)$ to obtain $({}_{79}^{197}Au)$ gold. As in the case of a controlled thermonuclear reaction at a collider, a pilot experiment is needed here.