

The Book ARCUS IV

An alternative Suggestion to the Model of Atomic Nuclei

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Some parts of this work are written in "Helvetica" by copies of given "The Book Arcus I and II", another part is newly written in "Times New Roman".

Structuring "TBA IV"

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1 Conditions and Theses

The Book ARCUS IV (TBA IV) is a supplement of my work "The Book ARCUS I" (TBA I).

I remember of a time when researchers ordered amounts of energy to the so-called quarks obviously derived from the sum of proton mass of about $938 \text{ MeV}/c^2$ by three times of $300 \text{ MeV}/c^2$. Some of an analogy, they did it to the pair of pions. An u-quark or a d-quark each had $300 \text{ MeV}/c^2$. But where the thinkers took their newest variants of energy equivalents from, I really don't know. Up to date, these values are $2.3 \text{ MeV}/c^2$ and $4.8 \text{ MeV}/c^2$. So I cannot draw comparing conclusions. All the problems are better explained by my model of lepton shifts published in December 2024 on Amazon KDP in "The Book Arcus III".

First, we study the nuclear binding by mass defect of each nucleon. Let's look how this problem can be explained. If a proton protocosm PK will be accelerated by support of an external momentum, so it is primarily packing away one or more sub-protocosms SPK. After this action, the internal mass M_p of the proton is decreased by this factor F_E . Resulting, the external proton mass m_p is increased correspondingly (7, eq. 4.1):

$$m_p = d F_E / M_p \quad \text{and} \quad d = 4.737155 \times 10^{-16} \text{ kg}^2 \quad (1.1)$$

$$F_E = M_p / (M_p - M_v) \quad M_p' = M_p - M_v \quad (1.2)$$

We understand the mass M_v as packed internal mass M in quantized portions of the protocosms PK, sub-protocosms SPK or sub-sub-protocosms (SSPK etc.). The result is caused by more kinetic energy of protocosms and their subs. By relativistic increase of the partons' velocity, the strolling way while emitting internal mass m will be shortened. Certain packages cannot be unpacked (evaporated) or vice versa: they will be packed (condensed). At the proton, this process directly leads to the sigma plus hyperon, delta plus hyperon etc. to the sigma asterisk plus hyperon with a single positive charge. This themes I described enough in "The Book ARCUS III". Now you see the reversed development of the energy support:

At the outside, one detects a mass defect at the nucleons' coupling of a neutron and proton forming a deuteron. It has a value of $1.113 \text{ MeV}/c^2$ per nucleon and binding. *Is it even possible to maintain such an average calculation?*

The proton is completely open at its stable state! It cannot produce (emit) more internal mass than this $M_p = 2.83212 \times 10^{11} \text{ kg}$. Consequently, it cannot have a smaller external mass m_p than before. *The proton is sucked out.* It just doesn't have more mass M .

Logically, at the coupling of proton and neutron, only the neutron can change itself (7, eq. 4.1). Only its mass m_n decreases to m_n' . The difference 2.225 MeV is the mass defect using newest values from Wikipedia. In the past, the value was 2.228 MeV . Now we find this internal mass:

Decreased $m_n' = (939.57 - 2.225) \text{ MeV}/c^2 = 937.345 \text{ MeV}/c^2$

$$F_E = m_n' / m_n = 0.997631895$$

The neutron as nucleon became lighter externally. What's on at the inside?

$$M_n' = d / m_n' \quad \text{or simply} \quad M_n' = M_n / F_E \quad (1.3)$$

$$M_n = 2.8282367 \times 10^{11} \text{ kg},$$

$$M_n' = 2.83495 \times 10^{11} \text{ kg},$$

increased by $\Delta M_n = 6.71346 \times 10^8 \text{ kg}$. The internal mass is increased.

It's worse than that: It even increased *above* the internal mass of the proton of the difference of $\Delta M_p = 2.84 \times 10^8 \text{ kg}$. **This amount the neutron has unpacked additionally! Its nucleon feature mass m_N now is only $937.3455 \text{ MeV}/c^2$. It is less than on proton.**

Such a result seems to be paradoxical. Where does this mass come from? Yes, as I explained it under (7), it comes from the energetically condensed protocosm PK_{e-n^-} of the electron, which was immigrated into the neutron. It has the necessary mass to be a condensation mass at its inside.

Until today, until you read my work here, nobody knows **that nuclides certainly bound by protons and neutrons, but only the neutron gives binding energy for the compound.** That's a shock! Proton gives absolutely nothing to the nuclide binding! It is sucked out and has no mass anymore in its protocosms to be emitted. It is on limit. And just this is the reason why it is a stable particle in my sense a stable BWH (Black White Hole).

There is no other reason in my model of matter! The thing is like it is. **Only the neutron still has reserves by its negatively charged lepton shift at its inside.** It's crazy. But it shows into the right direction. Yes, even I didn't know it when I published „The Book ARCUS I“ in 1998. But I wrote some assumptions.

At this time, in my older model of the atomic nuclei, I still continued calculating by divided mass defects of protons and neutrons. By adopting this epoch-making error of physics, my beautiful model of nuclides became wrong quantitatively, but remained interesting qualitatively. Now, here I correct it as follows.

2 My Model of the Structure of Atomic Nuclei

The neutron tips the scales as to whether the model fits, or it doesn't. In the case of the deuteron, the neutron controls these „1.1125 MeV/c² per nucleon“, so alone 2.225 MeV/c². That is very close to the approximate value of the quantum leap of about 2.3 MeV/c² called u-quark.

After some mistaken explanations, I calculated on page 547 three energy levels of binding on both nucleons divided (1, eq. 4.9,3). I thought, there was one first level for a deuteron binding n-p. So I concluded, if a proton would couple with a single neutron, always a binding energy of about 2 MeV would be free.

The next step would be the triton binding n-p—n where the proton couples with two neutrons. On average, both neutrons offer 4.24 MeV. But I think, both neutron energies are reduces from 5 MeV.

The third step I found by helium-3 binding p-n-p. This neutron is in need to give as much as it can to both protons. It gives the sum of 7.72 MeV into both protons, seen this way, 3.86 MeV into each proton reduced from 5 MeV. We still remain in the area of the triton binding, but now it is twofold.

It gets really good with the nucleon of helium-4. It makes a ring of an alpha link $\begin{matrix} p \\ n \quad n \\ p \end{matrix}$. Because of the ring-like coupling, the energy emission is increased up to 14.15 MeV of each neutron. So the neutron gives around 7.07 MeV to each proton, to the right and to the left of it. In the alpha link consequently 28.296 MeV have been emitted.

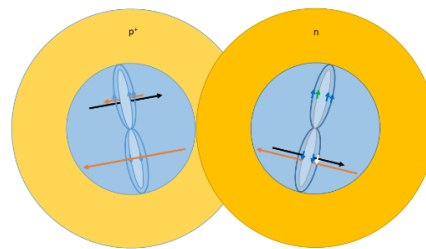
If each neutron of the alpha link would give 20.025 MeV then the sum would be 40.05 MeV. Because of the binding angle of about 45° to the protons, the binding energy decreases non-linearly with the factor of around 0.7 down to 12 MeV. This makes approximately the real amount of 28 MeV for the complete alpha link. The problem is that the neutron had to split its 20 MeV level into 2 parts, for each proton one part. So the proton would get 20 MeV parts and emit them because not needed. This proton would be an energy cosm. Such an EK must emit its surplus. Consequently, the energy level 3 has to be divided at a neutron while it is added at a proton onto each 14.15 MeV leaving by 2 portions of intensity. After continuing my theoretical researches, I found a completely different relationship of energy levels resulting on the basis of three features: 2.225 MeV/n, 5.006 MeV/n, 20.025 MeV/n (1: 9/4 :9 like x² to 1 4 9). The first two values remind of the energy of so-called “quarks u at 2.3 MeV and d at 4.8 MeV. I think there are just energy steps instead of real particles (that are cosms).

Such a ring only can exist if nucleons directly couple inside their gravitational horizon. This is just the reason of their extreme force called *strong interaction*. Nucleons neither you can find in shells nor in a simple drop order and also they are not in a quantum coupling. But, they are radiation cosms immersed into one another, coupled to a straight chain completely rotating around its gravity center.

- Although the neutrons and protons approach each other by contacts of their electromagnetic (e. m.) contacts of north and south poles. But then they turn around into the positions of the magnetic circuit or the ring-like combination because there is no resistance. As well-known, the magnet vectors are then one behind the other. Their e. m. spins have been compensated themselves completely. BUT the gravitomagnetic (g. m.) spins have been pulled along and turned onto repulsion. North and south repel each other gravitomagnetically. So they prevent the nucleons from falling into each other completely. Probably, it is running as followed:
- Electromagnets attract each other from the outside. They orientate their position by their strongest external interaction. As soon as the spheres have been immersed into one another, the static internal gravitation is acting attractively even mutually because each of both gravitational centers of each nucleon are at the outside from the inside of the other nucleon. Concluding, each nucleon „watches“ the other nucleon being an object “at its own sky like a gigantic star”.

- However, the repulsive force increases by g. m. spins of both nucleons (each the top R_o , the next R_o deeper is just the world area of mass and of the least radiation). It is caused by further immersion into the radiation cosms.
- Depending on the position, the positive repulsion potential of the static internal electric charge increases. Yes, also the neutron has a hard internal positive core discovered at scattering experiments!
- As the immersion now reaches its maximum, the external effect comes completely to the inside of the other nucleon and vice versa. The center of gravity also of the internal mass comes into the inside of the other nucleon. Therefore, the repulsion of the g. m. interaction by g. m. magnetons is extremely increasing. The e. m. magnetons are too weak. So the nucleon will be repelled by a gravitomagnetic angular momentum. It comes back to the area of the radiation cosm. There it gets its e. m. angular momentum, which leads back to the e. m. position as it was before. I think, there an equilibrium will follow from, which the electric magnet poles can tilt a little from their positions. But the mass block is rotating and creating my so-called phenomenal rotation, which prevents the system from falling into each other completely.
- Because radiation cosms overlap each other, it is clear that the neutron must emit radiation energy. As we know, the internal mass increases while the external mass decreases. The proton doesn't need the supported radiation. So this surplus will be emitted to the outside reversed using my equation (7, eq. 4.1d). Internal radiation cannot leave the inside directly. But a reciprocal value is able to leave the cosm horizon. So the mass defect is arising by emission of external energy of the spatial oscillator. Observing all the mechanisms, then this was no direct change of mass into energy Δm into $\Delta E=c^2 \times \Delta m$. This only is an equivalent! How you would exchange money for goods. So instead of mass, wave energy will be free. A direct change of wave energy into mass is not given. But you can reflect a mass by an oscillation energy being an oscillation with the constant light velocity square c^2 .

Illustration 2.1: Deuteron



Here, I insert the citation of my work „The Book Arcus I“. Important parts and new data, I marked now with blue color. My section 4.6. is the precondition to understand the coupling of nucleons. However, I have to add my newer knowledge to this right away.

„4.6. Nucleus Force as Binding of Oscillation Spheres of Cosms

Following the statement of Max Born, today one asserts that „particles" would have a „position probability". We showed clearly in section 2.11: wave quanta are dependent on interaction probability! True particles are geometrically limited cosms. As soon as the end of a cosm is reached, the probability until today seen as "infinite" finds its end here. The curved field of any spacetime has its end here. It is our proof that strong interaction remains unexplained until today. **Why does it end abruptly if protons could rotate around neutrons on orbits and reversed? Why don't you find here such a "position probability" of protons that have to diverge against infinite? However, because it is not real! Experimentally, a result was found, which I tell you now as follows:**

Strong interaction starts with overlapping of vacuum spheres $\Sigma_x-\Sigma_y$. It ends with the partial congruence of the oscillation spheres $\Sigma_{ox}-\Sigma_{oy}$ of two nucleons at least! This means: the internal relativistic distance R_{rot} of cosmic masses m and M is acting decisively. ... From the outside someone only notices the distances of vacuum spheres measured with amplitude numbers. Between r_o and R_o the **vacuum sphere** of the cosm is given. It represents the top part of the cosm radius r_o .

1. If two cosms are separated by vacuum and if their distance r , measured from central point to central point, is larger than $4R_o$, then only their external masses m_o are acting each other over

their accelerations $a = G_v \times m/r^2$ (additionally the electric charges and momenta are forming faces). Meeting of their momenta $p_{(n)}$ has importance (cf. eq. (3.2.4,1)).

The separations only can be conceivable as related to gravitational center even if the internal mass is structured and so it has intrinsic centers of gravitation. Mass properties are congruent in each cosm. This means: the gravitational center S_M of the internal mass M_o gets congruent with the gravitational center S_m of its intrinsic external mass m_o . Another mass m_x only takes part at the internal mass M_y if it has come under that oscillation sphere Σ_{oy} with its gravitational center S_{mx} . Then we speak of the coupling constant α_3 . If it has even underrun the vacuum sphere Σ then the external and the internal mass are acting onto each other. ... If the gravitational centers remain externally of both vacuum spheres then only the actions of the external masses are valid ...

The observer JOY1 living in his cosm x^+ must be localized in the gravitational center S_{Mx} or S_{mx} . That equally heavy and equally large cosm y^- comes close to him. As long as its central point S_{my} has not reached a point under the sphere Σ_x , the external relationship with the coupling constant α_1 is valid. JO only observes both external relationships. He can measure the masses m_x and m_y over the accelerations of a_x and a_y :

$$\alpha_1 = a_x / a_y = G_v \times m_x \times r_y^2 / G_v \times m_y \times r_x^2$$

$$\alpha_1 = m_x / m_y . \quad (4.6,1)$$

In this case $\alpha_1 = 1$ is valid because the distances of gravitational centers have to be equivalent. Special relativity of both external masses in agreement of moving referred to vacuum is the same. It doesn't change anything at proportionality of α_1 . Momenta are transmitted after eq. (3.2.4,1). If one of both masses is able to be localized by the observer, for example the mass m_y , getting a relative resting location, then the second mass m_x must be meant to be a relativistic mass m_{Ax} shifted by orbit velocity. The constant α_1 corresponds to the relativity factor f_{SRT} .

2. Now the mass center runs down below the oscillation sphere Σ_{ox} . "JOY1" is now the owner of the internal mass. He observes the other external mass m_y referred to the mass M_x rotating at the sky although he is certainly rotating. This means: the isolated mass M_x interacts with the external mass m_y . The distance r is smaller than $2R_o$ and larger than $1R_o \Rightarrow$ **closing of vacuum sphere** of each the other external central point of mass has happened: $1R_o \leq r \leq 2R_o$. Now the term can be written:

$$\alpha_2 = m_y / M_x \ll 1 . \quad (4.6,2)$$

For the other observer "JOY2" in cosm y^- , the observer relationship would be reversed:

$$\alpha_2 = m_x / M_y \ll 1 . \quad (4.6,3)$$

If two cosms meet together then also α_2 is valid. The momentum is transmitted at the masses magnetically. From time to time, radiation energy is enough for more kinetic energy of protocosms by eq. (2.4,14) but even of their pair formation after eq. (2.4,52).

3. Now the mass M immerses below the radius R_o . The distance r is shortened down to $r < 1R_o$, and the isolated masses M_x and M_y are acting to each other directly. We write for it:

$$\alpha_3 = M_x / M_y = 1 . \dots \quad (4.6,4)$$

This isolated state represents - taken itself – an external state again!

Because below the gravitation radius r_o of the one cosm the other cosm is disappeared. This other cosm means now to be external relatively to the other internal sub-cosms of the one cosm: internal masses are interacting now “thinking” they are external to each other. But their “movements” remain locked below their horizons. “For such a rotation movement, which we cannot notice externally we create the name **phenomenal movement.**”

At cosms of unequal gravitation, the same **three relationships** are valid that the relative impression of falling into each other will be determined by the metrical magnitudes of the cosm. ...

Let us examine how much the force of coupling is determined by α_2 . Because of the analogy to eq. (3.2.3,46), it is valid:

$$F_2 = G_v \times M_o \times m_o / (k_r^2 \times R_o^2) \quad ; \quad (4.6,10)$$

$$k_r = \text{distance factor for } R_o \quad ; \quad 1 < k_r \leq 2 \quad .$$

Using the eq. (3.2.3,51) and (2.15,7), we can change it into a new one as follows:

$$F_2 = G_v \times K_{PI}^2 \times \alpha_2 / k_r^2 \quad ; \quad (4.6,11)$$

$$\alpha_2 = F_2 \times k_r^2 / F_o \quad . \quad (4.6,12)$$

The constant α_2 represents an isolated force relationship to the maximum force constant F_o in relations to the distance factor of the gravitational centers k_r ! $\alpha = \alpha_{gq}$, it is an electrogravitational constant.

With such an exchange, the gravitational force F_1 can be represented at the external field; but the isolated force F_3 can also be represented like this:

$$F_1 = G_v \times m_o \times m_o / (k_r^2 \times R_o^2) \quad ; \quad k_r > 2 \quad ,$$

$$F_3 = G_v \times M_o \times M_o / (k_r^2 \times R_o^2) \quad ; \quad k_r \leq 1 \quad , \text{ from, which these relationships are following:}$$

$$F_1 = \alpha_2^2 \times F_o / k_r^2 \quad ; \quad (4.6,13)$$

$$F_2 = \alpha_2 \times F_o / k_r^2 \quad ; \quad (4.6,14)$$

$$F_3 = 1 \times F_o / k_r^2 \quad . \quad (4.6,15)$$

These three forces $F_{1,2,3}$ are able to be set into external and isolated relations; a constant k_r is assumed.

$$F_2 / F_1 = F_3 / F_2 = 1 / \alpha_2 \quad , \quad (4.6,16)$$

$$F_3 / F_1 = 1 / \alpha_2^2 \quad . \quad (4.6,17)$$

If we set the calculated nucleon magnitudes for an initial solution of the strong interaction problem into this eq. then we get a feature of α_2 , for example, referred to a chain-link of that atom nucleus in the shape of a certain deuteron being in that state in which the neutron hasn't yet given free isolated energy for binding:

$$\alpha_N = m_p / M_n = 5.92197 \times 10^{-39} \quad , \quad (4.6,18)$$

$$F_N = \alpha_N \times F_o / k_r^2 \quad . \quad (4.6,19)$$

The coupling constant of strong interaction then corresponds approximately to the proton-neutron-coupling constant α_N .

Because of (4.6,13), (4.6,16) and (4.6,18) the **strong interaction force** F_N as a vacuum sphere force F_2 has the relationship to the externally acting **gravitational force** F_{grav} of these nucleons F_1 as followed:

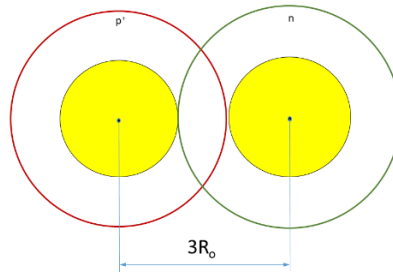
$$F_N : F_{\text{grav}} = F_2 : F_1 = 1 / \alpha_N$$

$$F_N : F_{\text{grav}} > 1.689 \times 10^{38} : 1 .$$

(4.6,20)

This amount is close to the expected range of values. At $r \approx 10^{-13}$ m it is $10^{20}:1$ increasing onto at least 41 magnitudes at $r \approx 10^{-16}$ m (cf. Q. 14, p 21, Illustration 5). Here we find about 38 magnitudes at the double the distance. This graphic is not drawn exactly. But you can see how much internal gravitation called „strong force“ is measured relatively to the external gravitation. Below you will learn that even the relationship of the double value is valid: $3.4 \times 10^{38} : 1$ (cf. Table Calculation in the website).

Illustration 4.6;1: Farthest range of the inner-cosmic forces between two nucleons. α_2

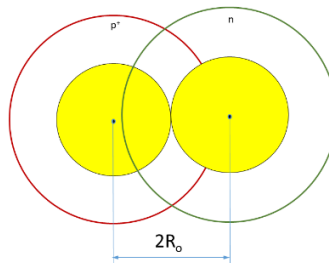


Here the cosmos are still in external relationship ...

Unless the gravity center of the internal mass is immersed in the other internal mass, it is always relatively outside for each other observer.

The gravity center of the external mass m_N can fall down to the horizon $2R_N$. As long as it is falling, it is relatively at the outside. Then its top protocosms have already reached the distance of $1R_N$ where "strong force" has got its maximum. If now the above called gravity center would fall completely down below the horizon, the internal forces would interact after α_3 . They would force the other particle into the system of its intrinsic elongation. In the nucleon, the main force F_3 determines all relationships now. The electric force is subordinated.

Illustration 4.6;2: Area of effective reach of the inner-cosmic forces between two nucleons. α_2



Strong force is decreasing then while exceeding the distance of both gravitational centers of

$$1R_N = 2.1 \times 10^{-16} \text{ m up to } 3R_N = 6.3 \times 10^{-16} \text{ m}$$

(see illustration 4.6;2), because it changes into the electric attraction of the elementary charges $\pm e_0$ below the amplitudes R_p and R_n at the flank of the horizon.

Experimentally, the radius of strong force of a nucleon was discovered finding the amount of about 1.1 Fermi (1 Fermi = 1×10^{-15} m) because there are distances of forces (cf. section 4.9.). Repulsion presses the charges into top position. While the centers of the internal masses appear in the distance of the maximum of $2R_p$, the positive charges rotate around half the proton amplitude $\frac{1}{2}R_p$. The actions are added. We found, there are five proton amplitudes R_p for d. This is the apparent "nucleon interaction radius" like seen today:

$$d = 5R_p = 1.05 \times 10^{-15} \text{ m.}$$

This dimension ought to hit the apparent interaction radius of the nucleons.“

End of citation.

Well, as I had another look at my past work intensively, I found a lot of something new. Explicitly, I have to explain the three observer positions:

External Observer JO:

He is we in this world.

At this position, the external gravitation is reacting by exchanging of primary fallons of nucleons. Additionally, the external electrification is interacting by exchanging of primary photons forming the electrostatic force and forming the electromagnetic interaction by secondary photons.

Internal Observer JOY1:

This subject watches a nucleon appearing at his horizon seen from the inside. This nucleon exchanges now its external fallons with its internal fallons (extremely stronger). The strong interaction is beginning from his side between internal and external mass ($m - M$). Mass block starts rotating. The pulsating surface (r_o) of the nucleon appearing in the sky points into this direction of the gravity center of its own external mass.

Internal Observer JOY2:

Also this subject watches a nucleon appearing at his horizon. This nucleon now exchanges the same features as its partner nucleon: its external fallons and photons with its internal fallons (extremely stronger) and photons. The strong interaction force is beginning for this observer in the same way as for JOY1 ($m - M$).

But what does the observer JO detect?

At that time of my first book, I missed something. Both observers JOY1 and JOY2 develop a force for each position in the relationship of eq. 4.6.20! So we get the force twice, which only the observer JO is able to detect from its external location. Each subject of both observers named JOY only detects half the strong interaction force.

Yes, dear reader, Ladies and Gentlemen, this is RELATIVITY! You could get crazy with it. I don't hope so for you.

Very important remains that I see a rotation inside the nucleons. Those protocosms, which create the e. m. contacts to the outside are standing still approximately. They vibrate a little. But these protocosms, which are equalized by their quantum numbers form out the mass block in the center of the differently electrically charged top protocosms. And this block is allowed to rotate to their heart's content without that you would notice something on the outside. It is really funny: The top PK are tilting while their movements. The central PK form a rotating sphere. I think using my natural healthy mind that I want to imagine all the things as if an animation movie is running before my eyes. Everything I can't believe doesn't happen.

I'm looking for an explanation of the permanent coupling of two nucleons at least. Central masses are oscillating. They're coming and going. But the neutron then has the bigger internal mass than its partner the proton. That's why the internal oscillations are not running in the same cycle or synchronously. They are offset by the difference of the oscillation in time. What this means, I have to discover externally from my book.

But if the oscillation is offset, even then the complete internal mass is not always a linear gravitational effect. It increases and decreases. Continuously, it has a different relationship. So the positions of both nucleons are continuously in motion. They climb up and fall down. Because they cannot run away, in this area, there must be a "back and forth". In a way, this is a modulation on the rotation of the mass blocks of both nucleons.

The deeper the radiation cosms immerse into each other, the stronger is their binding, too. So I found three essential binding levels to explain the different mass defects. We see it later below in connection with the average rotation velocity of these three levels.

Binding by the radiation cosms I imagine as follows. The one and the other exchange their fallons. The g. m. interaction (wave quanta exchange) then is not more as the expression of the existing forces. How I always say: *The exchange of wave quanta generates a force. It is not the exchange of cosms (if it was a cosm exchange then the cosm is changed)!* So I have to remember you again that I explained the equivalence of wave and particle to be invalid. It's a *cardinal error* of physics!

In this connection, the depth of the overlap of the radiation cosms has to be a measurement of the strength of the coupling of the strong interaction. Such an overlap doesn't fall out of another as long as it exists after emission of that radiation value corresponding to the mass defect. This isn't a change of mass into radiation energy!

Let us ask: Do the nucleons exchange internal radiation from the binding lens? No, they don't. Both nucleons remain to be closed microcosms. Nothing can exchange overcoming their horizons. The stable proton get the surplus of energy changing into an energy cosm EK and forced to be emitting it.

But the internal density is not enough to form a closed electric cosm. Therefore, these charges you can measure on the outside without changing.

It's important to know: From scattering experiments, the physics found out that the volume of the atomic nuclei is directly proportional to their external mass. Scientists conclude from this only one premise: There must be a spherically symmetrical drop of nucleus. Is such a conclusion allowed? Please, follow me! If you take a cube and you would then stretch it to a long cuboid or anything, which has the same volume as the cube before, then this is not a spherical drop fitting into the cube, but it's an elliptical or a circle-like slice of a defined depth. And you see, the volume is still proportional to the mass!

Do you understand? To conclude from a volume and from its density on a sphere, this is absolutely a special case! I could imagine that the layer depth of the nucleus would be 1 fm by one single layer of nucleons. The multitude of nucleons then could be distributed inside the area of this layer. So the density and the volume would remain unchanged if nucleons would be close to each other.

I don't think much of the drop model of the atomic nucleus. The thought of how a drop U-235 is cut by a single neutron is strange to me. Such a process doesn't fit my common sense imagination. It would have to be an knife that cuts slices and refuses to cut extremely small slices. This doesn't fit to the reality where nuclear fission leads to mass number maxima. In the meantime I got more knowledge.

We find almost exactly twice the mass defect of helium-4 in beryllium-8: 56.5 MeV. It sounds good. But it mislead me in my "TBA I" to believe that alpha links would *directly* couple with each other forming greater nuclides. But this is *not real* if you take in your account the *binding energy*!

While coupling of both alpha links to Be-8, they only reach 0.046 MeV energy supply in binding ($2 \times 28.296 - 56.5 = 0.046$). At the binding location (2 neutrons), these are even just 0.023 MeV of each neutron. Such a low mass defect of 0.023 MeV/c² of each binding neutron is as weak as this coupling decays into 2 alpha links after a time period of 96.9 as (after around 10^{-16} s). Energetically assessed, this binding doesn't hold.

But this is only a measurable indication, which can be explained by the oscillation of the internal masses. Some-time, however, they lead to repulsion. But what is the cause?

It is the strength of the internal coupling of the alpha links.

An alpha link has attracted the e. m. spins close together bound in a ring so that externally e. m. and g. m. zero spins are acting. No nuclide, no nucleon is able to couple over a zero momentum. There must be a structure, which has a surplus of an e. m. spin having the chance to bind at a proton or a neutron of the closed alpha ring.

Some fifth nucleon basically breaks the ring at a proton to be involved. The proton has a second electromagnet by, which it can dock a neutron. He-5 but emits the neutron again.

As a result, nuclides only can grow by docking neutrons or protons or both or even heavier nuclides. Then they decay by neutron emission, proton emission, alpha link secession or beta-minus and beta-plus processes and by nucleus-capture, too. After the initial e. m. coupling, alpha links develop a very strong binding.

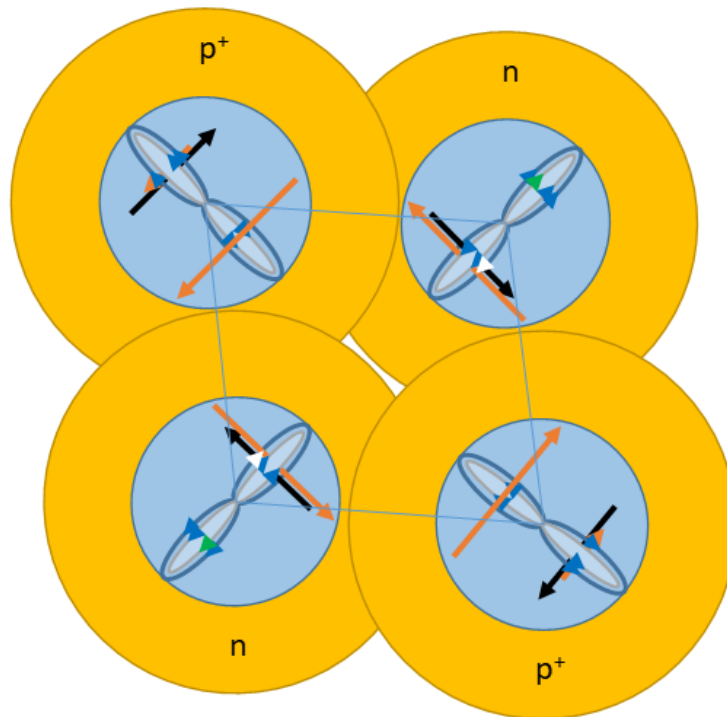
At beryllium-9 we find 1.65 MeV to 56.5 MeV by the coupling of the binding neutron, the sum is 58.16 MeV. Because of the decrease of the ring energy but this neutron gives about 2 MeV of each proton.

Protons repel themselves electrostatically in the turn of their alpha links. So this building of a ring-like nuclide becomes a parallelogram instead of a quadrat in the first moment of watching.

Realizing this though in my “TBA I“, I created the sign \diamond . Deciding the positions, I turned this sign around by 90° and got this \blacklozenge . Now I was able to symbolize the coupling of alpha links: $\blacklozenge\blacklozenge$ (beryllium-8*). My mistake was to believe that would go on this way. BUT: These links cannot couple directly with one another, they only can by neutrons: $\blacklozenge\blacklozenge$ as beryllium-9. Also such a structure could be possible: $\diamond p\diamond$ as boron-9*. The proton is twisted by the magnetons, comes close to the protons of the alpha link and creates by its energy the pairs of ΔL and one Higgs block H_e . So it changes into a neutron while emission of a positron and a neutrino. Beta-plus-process lead to the Be-9. In my “TBA III” I wrote on pages 51 to 56 about these processes.

A neutron can decay by its own surplus of energy of 1.2909 MeV (p 938.2796 MeV - n 939.5705 MeV) by formation of a Higgs block H_n . But now as nucleon neutron it has not enough energy to decay. It is missing 0.935 MeV (n_N 937.3455 MeV - n 939.5705 MeV). So the nucleon neutron is temporarily stable (“more stable” than the proton).

Illustration 2.2: Coupling Inside an Alpha Link



Summarizing in the end, all the energy differences would arise of the complete nuclides as “mass defects“ being *energy defects* from oscillation. This was my idea: To have an analogon on chemical compounds. But no orbitals like at electrons because also the quantum model of orbitals, where nucleons are rotating on shells, is not real!

Now my calculation of mass defects expressed in energy values is mistaken in my “TBA I“. In any case, we watch an increase of binding energy over neutrons of the simple deuteron binding up to the helium-4 as a ring-like link:

D	n-p	2.225	Form of Chains
T	n-p-n	4.24 on average	Curved Chains
He-3	p-n-p	7.72 each transmission at 1 p of 3.86	

He-4 $\begin{matrix} p \\ n \ n \\ p \end{matrix}$ 14.15 MeV on two p: 7.07 Ring-like form expressed as parallelogram ♦.

Nuclides arise from all these offers of shapes. Alpha links (rings) will be bound with chain links (p, n). If alpha links are forced to direct coupling, the decay followed by alpha radiation. While couplings, [spatial structures arise like at the chemical compounds](#). As I already wrote in TBA I“ about atomic nuclei, the binding energies aren’t only dependent on the density of repulsion of protons but also on the angles of the nucleons to each other. A particularly large amount of binding energy seems to be emitted under the condition of free couplings of magnetons. Rotations lay in one plane. In He-4, they stand in angles of about 45° to each other what is weakened the binding. But the ring structure is supported. Energy difference of 7.07 MeV and 2.225 MeV reminds of “d-quark” at 4.845 MeV, too.

I cannot derive more precise cohesions here because the conditions of the bindings are very diverse. In “TBA I” I calculated some effects of the angle values as a suggestion. In “The Book Arcus III” I resumed that “quarks” do not exist at all.

Nevertheless, I see a tendency at binding energies, which I calculated each on a neutron participating. Helium-4 starts at the top. After it, the binding energy of each neutron is increasing from 14.12 MeV onto [17.1 MeV](#). [This is the maximum at calcium-40 with the relationship of 1:1 protons to neutrons](#). Heavier and stable isotopes never have this relationship n:p=1:1 again. Nickel is close to the maximum, but iron is below. So I wonder about nuclear fusion in the stars. It had to find its end at calcium if we would use the average of the energy emission of neutrons. But how do we come to iron? Well, it is just an average. Iron has more neutrons lying on the outside. It will be fact that the effective iron’s nuclear fusion *is slowly* coming to a standstill. There is a transition, no break!

My model is helping me again at this position: The BWH-core of a star continuously emits fusion energy into the “gas sphere“ of this star. So almost heavier elements than Ca-40 even transuranic elements can be synthesized by very strong energy support. Today, one thought, this is only possible while supernovae.

With uranium-238, the average binding energy per neutron is decreased to 12 MeV.

So we ask now: How much of its surplus of kinetic energy can neutron’s protocosms maximally transit and emit to the outside over the radiation horizon?

The result is well derived by Ca-40. I found different values from literature in the internet like this here: 16.5864 MeV/n. The complete radiation surplus will be emitted. Using eq. 1.3, we get the following result for Ca-40:

$$m_n' = (939.57 - 16.586) \text{ MeV}/c^2 = 922.984 \text{ MeV}/c^2$$

$$F_E = m_n' / m_n = 0.98235$$

The neutron nucleon externally became very much lighter.

What is on at the inside?

$$M_n' = d / m_n' \quad \text{or simply} \quad M_n' = M_n / F_E \tag{2.1}$$

$$M_n = 2.8282367 \times 10^{11} \text{ kg},$$

$$M_n' = 2.87905 \times 10^{11} \text{ kg},$$

$$\text{increased onto } \Delta M_n = 5.0815 \times 10^9 \text{ kg}.$$

[These are about 1.8 hundredth of the internal mass what the neutron maximally has on its inside. It would be able to emit more if there were different binding partners than the somewhat lighter proton. But God gave no other particle than the well-known proton.](#)

It is like it is. At Calcium-40, the binding energy of the neutron is the most.

That something like this is even possible inside the calcium atomic nucleus is the result of stored energy at protocosms of lepton shift ΔL^- . The internal energy of the free neutron is decreasing while the top protocosms’ velocity is decreasing expressed by the factor of the Special Relativity Theory SRT, briefly f_{SRT} . Neutron’s protocosms in the center are completely open like it is also in the center of a proton. Well, if now is more time to stay open, this makes no change of the almost open internal mass. But if we come to the electron protocosm PK_{en} , which is inserted to the neutron and condensed there as one part of ΔL^- , so we get an energy storage.

Overview 2.1: Calcium-40

Consequently, the neutron system tries now to profit from that lepton shift $PK_{en^-} / \bar{v}_{en-R} = \Delta L^-$ as long as it is just possible. Lepton shift in the neutron cannot open or evaporate. Its speed can be slowed down. Now the kinetic energy of those protocosms, which speed were reduced, goes onto the outside. The mass defect is externally effective being radiation energy.

Binding energy can be explained in its origin by this mechanism.

When the neutron has lost some energy, it cannot restore this amount from itself. Just then if this amount is given again, the neutron can get free. Always it is the neutron, which dances around the proton as it would be a lovely partner in the center. Energy differences occurring in the process are reminiscent of the so-called "quarks".

But I still have a problem with the nuclear spins. I have doubts about the values of the nuclear spins based on the electromechanical parallelism. In Internet's "Wikipedia", I found the following important sentences. I give you the citation self-translated from the German site.

„Medicine

→ *Main Article: Magnetic Resonance Imaging*

The *magnetic resonance imaging* or *nuclear spin imaging* uses *nuclear magnetic resonance*. Magnetic resonance imaging machines in medical use to measure the distribution of the hydrogen atomic nuclei (protons) in human body. In contrast to X-rays, changes in the tissue can usually be made clearly visible. Magnetic fields with a gradient are used for three-dimensional sectional images (so a continuous increase of strength) so that one can conclude from the frequency onto the spatial location if the resonance condition is realized.

Macroscopic Effects

As angular momentum, the nuclear spin is quantized in the same unit \hbar as the angular momentum of the shell. But it has just a tiny effect of the magnetic properties of atoms or of macroscopic pieces of ordinary matter because of its over 1000 times smaller magnetic moment. At very low temperatures and individual cases, however, the effects of the degrees of freedom (setting options) of the nuclear spins are clearly visible:

- The specific heat of hydrogen gas (H_2) shows a special temperature profile at temperatures below 100 K. This can only be explained by the fact that both nuclei (protons) of the gas molecules each have a nuclear spin $1/2$, which they put parallel in $3/4$ of the molecules (orthohydrogen) and antiparallel in $1/4$ of the molecules (parahydrogen). In both cases, the complete spin of both nuclei (and of the molecule) is integer, but in orthohydrogen all rotation levels with uneven molecule angular momentum are missing, in parahydrogen with even. These settings remain in gas molecules for weeks despite the numerous collisions among themselves. This discovery was the first to prove that the proton has the nuclear spin $1/2$.
- Bose-Einstein-condensation changing liquid helium into a superfluid state only is possible at the common isotope helium-4 but not at the seldom helium-3. The reason is that a helium-4-nucleus has a nuclear spin of zero making the whole atom to a boson while a helium-3-nucleus has a nuclear spin of $1/2$ making the atom to a fermion. This has an effect on the symmetry or asymmetry of the quantum mechanical state of the liquid helium compared to the exchange of both atoms, and it leads to the difference described above in macroscopic behavior of both isotopes.“

So much for the quote that confirms my hypothesis: The so-called "spin" is derived from the **electromagnet**. Then it is related to the Planck's quantum. It says right to the beginning of the text: "Magnet resonance imagine or nuclear spin imagine". Using the term "or" it is said that there is no clarity: Magnet or nuclear spin? Electromagnet or spin? What is my imagine of these things before I tell you about my model?

Speaking of a spin, physicists mean an **electromagnetic field**. More isn't. More than the behavior of hydrogen – so the protons – one doesn't find out. The interactions are too manifold. The so-called „nuclear spin of $1/2$ “ is nothing more than an equivalent of the electro-magneton of the proton. By defining it as elementary positively directed, it is marked by the assignment of $+1/2 \hbar$ as was analogously done with the magneton of the electron. This is the result of taking along the classical physics resp. of the "electromechanical parallelism".

Using my model, I get different polarizations of g. m. spins in relationship to the e. m. spins. For example as followed: ***Neither the electron nor the proton or the neutron are rotating around their intrinsic axis creating the certain magnet field, which direction is defined with the concept "spin"***.

I say: Inside these microcosms, top protocosms are rotating on their orbital having *integer* electric charges by what they create the elementary magnets, it is almost related on half a period time $\tau_o/2$ resp. half a vibration length $\lambda_o/2$ of the receptacle cosm. Half a period time $\tau_o/2$ is always exactly half a Planck's quantum $\frac{1}{2}\hbar$. The protocosms always rotate a complete circle or a complete ellipse creating $\frac{1}{2}\hbar$! But you are able to measure the complete period of the spatial oscillation radially $R_o=\lambda_o/2\pi$ by $1\hbar$. I defined this behavior to be a gravitomagnetic process. It is not an electromagnetic behavior! *That's the difference!*

Theory of electromechanical parallelism expects now the equality of $1\hbar$ and an integer magneton. But – what an ace – this equality never has been realized. The electron deviates from it. The proton does it also, even next to three times and the neutron twice. Well, why is this the reality? Because the equality of e. m. and g. m. effects does not fit!

The radius of the protocosm bow way is half of it: Orbital radius of a protocosm $R_{orbit}=\lambda_o/4\pi$. From this results $\frac{1}{2}\hbar$. *This fact I often explained. It's enough!* Elementary particles as well as each other receptacle cosm mustn't rotate inevitably. It has to follow its e. m. momentum to orientate anti-parallelly! In a strong gravitational field, it even must follow the g. m. momentum to set up parallelly. The complete spin problem got confused by the present physics of classic opinion of charge and its rotation.

Nucleons don't move on trains resp. orbitals forming an atomic nucleus. Nuclei rotate in the complete shape of their constructs. Also they don't fill out a spherical or ellipsoidal space. Rather they are similar to galaxies with two arms.

This is the reason why I see the complete nuclear spin calculation as blurred. The atomic nuclei rotate as a whole around their centers of gravity.

Additionally, the electrically charged protocosms *inside* the nucleons rotate in complete cycles. By this process, the electro-magnetons arise setting subtractively or additionally. The whole problem isn't mine while I establish my new atomic nuclei model on basis of the protocosms. Let the physicists clarify this later!

Now let's observe the deuteron (cf. Illustration 2.1). When e. m. vectors (spins) are coupling one after the other, the g. m. vectors (spins) are forced. How does it happen? Proton and neutron we observe from the same perspective with each the g. m. spin $\frac{1}{2}\hbar$ and $\frac{1}{2}\hbar$, together $+1\hbar$. This way, their g. m. magnetons are forced to be added. But they behave repelling at north pole (positive vector) and south pole (negative vector). So they press the attractive e. m. north and south pole from its straight line. Then their e. m. spins act attractively and additionally. They close their magnetic flow: $-2.8/2\bar{\mu}_N - 1.9/2\bar{\mu}_N = -4.7/2\bar{\mu}_N$. This e. m. formed momentum I briefly and definitely call: $-5/2\bar{\mu}_p$.

Science has decided simply to set the Planck's spin $\frac{1}{2}\hbar$ to each nucleon parallelly to inform about the spin of a deuteron by $1\hbar$ although it's not true at all because this spin is electromagnetically (e. m.) determined. The rule is correct: Even nucleon number = boson, uneven nucleon number = fermion. Conclusion: The always so-called "spin" is not derived from a gravitomagnet \hbar but from an electromagnet $\bar{\mu}$!

He-4 is a ring by my **structure model** in which the magnetons (the e. m. spins $\bar{\mu}$) and the Planck spins (the g. m. spins \hbar) are **completely** compensated to zero. *Absolutely zero!* Only therefore, the well-known effect of the Einstein-Bose condensate can be true. From this we can see what pit science has dug up to now by setting the e. m. angular momentum equal to the g. m. angular momentum using the classic "electromechanical parallelism".

Conclusion: My spin values of nuclides *in the shape of e. m. spins $\bar{\mu}$ and g. m. spins \hbar* , (if I tell them) will differ from all the information and publication of the past! Only the deuteron can have the g. m. spin of $1\hbar$. All the other atomic nuclei have either zero or one-half or cross connections. Apart from that, they develop their own electromagnetic effects.

If a neutron is attached to an alpha link (He-4 nuclide) then the g. m. spin of the neutron is following as a result in the negative sense of $-\frac{1}{2}\hbar$, and the e. m. spin follows to $+2\bar{\mu}/2$. Until now, one shifted the imaginary spins to $-3/2\hbar$ probably caused by the axiom $-\frac{1}{2}\hbar$ "plus" $-2\bar{\mu}/2 = -3/2\hbar\bar{\mu}$.

"Unfortunately, it is impossible to add pears and apples", so my math teacher said to us idiots at school. But the science didn't only merge e. m. and g. m. spins (Dirac, Fermi), it has even merged *wave and oscillator* (the particle) to **one** (de Broglie, Schrödinger, Heisenberg, Born ...). Now I would say instead of my teacher: "It would be as if her mother's daughter were also her mother's mother." Or: "The cherry pits throw themselves." Today one tells the students: „Well, this is quantum physics at all, it is nothing for common sense!“ And I say:

<An oscillator as its own wave, and a wave as its own oscillator.> This is a total nonsense! The e. m. magneton of a nucleus as absolute spin creator is half of the reality!

Let us observe helium-3. It also has superfluid properties like He-4. How should this be possible for a fermion? One explains it as follows: Two He-3 nuclei couple with each other electromagnetically, and so they will become a boson caused by the symmetry of all their properties. This is necessary like at He-4 where every property is to zero. My model makes it possible by the ring structure of the alpha link (He-4 nuclide). The protons and neutrons are alternately connected to each other via their radiation cosm areas to form a ring. This leads to a very special binding density measured at the mass defect. E. m. and g. m. nucleon-spins are set to be zero to the outside, too.

Consequently, my e. m. spin and g. m. spin had to be zero at the double of He-3? Let's see if that can be true: Yes, the e. m. directions expressed by arrows show the complete compensation. And so nothing more remains for the g. m. spins given in asymmetry turning around the middle axis by the e. m. directions:

$$\begin{array}{ccc} p\downarrow & & \uparrow p \\ & n\uparrow - \downarrow n & \\ p\downarrow & & \uparrow p \end{array}$$

The right nuclide had to be the exact contrast to the left part because of the anti-parallelism of the neutrons. Then it fits: All the quantum numbers are equalized. But one thing isn't correct: The single left He-3 has the g. m. spin of $-\frac{1}{2}\hbar$, the right has $+\frac{1}{2}\hbar$. The e. m. spin balance is $(-2.8-2.8+1.9=-3.7$ left and $+3.7$ right) absolutely $\pm 3.7 \mu_N = 0 \mu_N$. A single He-3 (${}^3_2\text{He}$) nuclide would have then half a spin depending on where the observer is located. In analogy to this, the triton nuclide is given that cannot couple into an analogon of the He-3 because of the strong repulsion of both protons. The fermion ${}^3_1\text{T}$ remains:

$$\begin{array}{ccc} n\downarrow & & \uparrow n \\ & p\uparrow \text{-----} \downarrow p & \\ n\downarrow & & \uparrow n \end{array}$$

The left triton but had the g. m. spin of $-\frac{1}{2} \hbar$ itself and the e. m. spin of $-1.0 \mu_N$ (left: $-1.9-1.9+2.8 = -1$). So far, my spins up to He-4 are still consistent with today's science.

But then, it goes haywire. My alpha links remain at spin zero. Each coupled and inter-coupled nucleon determines now the completely resulting spin. From this, He*-5 only can have a single half spin as well as g. m. and e. m.:

$$\begin{array}{ccc} & \uparrow p & \\ \downarrow n & & \downarrow n \\ & \uparrow p & \\ & \downarrow n & \end{array}$$

He*-6 had the e. m. spin of -1 because two neutrons add it:

$$\begin{array}{ccc} & \downarrow n & \\ & \uparrow p & \\ \downarrow n & & \downarrow n \\ & \uparrow p & \\ & \downarrow n & \end{array}$$

My rule is now: Both spin types of an atomic nucleus, e. m. and g. m., are determined by those nucleons, which couple at the alpha link when the alpha link itself remains unchanged with its complete spin of zero. If such nuclei rotate around their middle, a new magneton has arisen laying above the e. m. nucleus-spins.

Atomic nuclei arise by collisions of nucleons and/ or nuclides. While this processes, all the possible and impossible intermediate states are forming out decaying as long as a stable nucleus isn't arisen. By the way, it happens in the stars at extreme heat. That means extreme kinetic energy and extreme repulsions by extreme collisions. Probability of a good hit is extremely less. To lead nucleons to each other under the condition of extreme cold might be the best way to fusion.

Why actually? I always thought, the nucleon had to bring along a collision energy to enter into the rate of coupling by a quantum leap. This way, the certain energy quanta would come free proportionally to the mass defect. These fact to bind into a clear cohesion is very difficult. A shell model could explain quantum leaps. If all the

neutrons would have the same value, then there the same shell for all had to be. That's not real anymore! What can my model do for explanation?

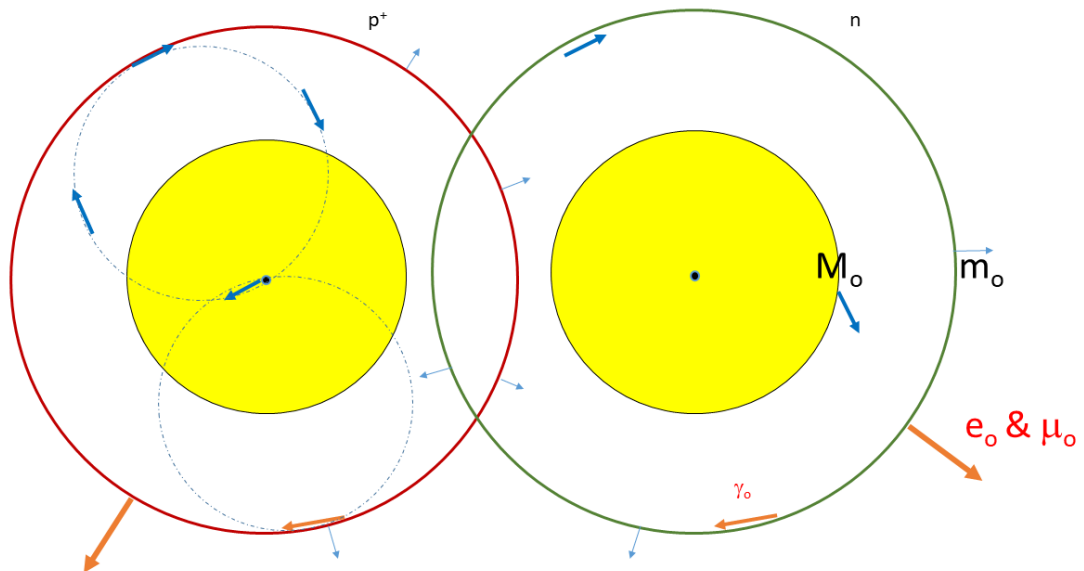
A proton doesn't repel a neutron. Both particles are e. m. attractive. There is no top. So the one nucleon immerses into the other nucleon. Almost the same size, they form an overlapping lens. It is not enough to say that one nucleon then appears in the sky of the other nucleon. An external appears to the internal. It gives its external mass m to contact the internal mass M . By my illustration 2.3, I want to show the directions of the interactions.

The external gravitation is caused by the internal pulsation as spherical wave. We see, in the beginning its vectors or its exchange wave quanta for external mass m_0 still show vertically to the emission and absorption area of the spherical cosm (particle). It is the same when an elementary electric charge e_0 makes a spherical wave. It goes *radially* over the border of all the internal g. m. cosms. The reason is: The internal electrostatic density is too small as also the external back pressure of the exchange wave quanta. So no electric intrinsic cosm can arise as a receptacle of a hierarchy. Consequently, the elementary electric charge reaches out of all the cosm borders. It is primary. **Its photons** are primary. The same behavior has the electrically caused magneton μ_0 .

The internal mass M_0 of a particle but creates a new black-hole density closing the cosm. So its exchange wave quanta first are running straight on in the proximity of the gravity center of a partial mass of M_0 . But soon they run away in bows. The gravitational pressure from the outside is big enough. At the horizon r_0 , the vectors fly parallelly to the line of perimeter. They cannot cross the perimeter U_0 and return back to the center. These fallons are secondary. They keep close their internal mass. It is the same with the internal photons γ_0 , which have arisen by annihilation after evaporations of the protocosms. They cannot cross the internal area by r_0 because they are bound at their intrinsic radiation cosm the same way as if it was an equivalent mass cosm.

At opened protocosms, both the mass M_0 and the radiation γ_0 are the same to curve the environment.

Illustration 2.3: Interaction Quanta in Nucleon



The density of photons is much greater than the density of internal mass M_0 . Why? Well, there is much more annihilated than remained. So these secondary photons γ_0 are also moving tangentially to the perimeter (circular arc) of the cosm $U_0 = \lambda_0 = 2\pi r_0$ like fallons of M_0 . Dear readers, here you see that internal mass and external mass of each nucleon are coupled. This connection is gravitostatic. It seems to attract both masses forming their field force from it, each for itself, consequently seen from the outside and measured 2 times. You also can see that from the internal mass cannot run a vertical interaction to the end of the cosm anymore. Geodetic lines are immediately curved.

If now both potential nucleons meet and immerse into each other, then suddenly the neutron has more internal mass, and the proton, too. The proton now would weigh a little less at its outside. The neutron also. But the part of the external mass m at the internal mass M is extremely small by the sum: about $1.7e-27 \text{ kg} + 2.8e+11 \text{ kg}$. This doesn't lead to a mentionable binding energy of 2.225 MeV (it is the 421.7th part of the proton). Well, where does it come from, however?

I start thinking that the electromagnets set the positions of the nucleons to each other. So all the top PK couplings are in motion. But the central protocosms, generating the mass block, completely begin to rotate like a ball. Their rotation speed makes a coupling level, for example the level 3 with 2.225 MeV. By uploading this energy on a neutron or a proton, the cosm had to condense and to become lighter internally and heavier externally. It is the effect now that the neutron emits this energy into a proton over the overlapping lens. That's why it is able to evaporate the electron protocosm more, to increase internal mass, to decrease external mass, to stabilize more being a nucleon now going into a binding. Proton emits its energy surplus.

Binding means: When the neutron has lost these 2.225 MeV, it cannot disconnect from the proton anymore. Just when it gets back this energy amount, it can become a free neutron again by condensation of a certain bit of internal mass.

Neutron has 1.2909 MeV more than the proton. Now, after binding, it has 0.935 MeV less. It is very good stabilized to remain inside the nuclide.

I don't want to draw all the atomic nuclei but just some examples. The most of them I publish in my appendix to the "TBA IV" ("Atomic Nuclei" by Ackermann, Heinz-Joachim: Atom-Nuclei.pdf).

A condition of the coupling is the polar and massive symmetry in der chains of stable bindings. At the beginning of the series of nuclides, we find indications of their stability under this condition:

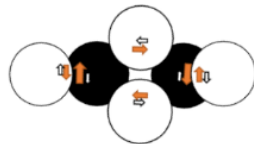
Only a neutron gives mass- and energy-equivalents out from its condensed electron protocosm captured in the neutron to force a state of binding with a partner nucleon.

Diproton:	pp	unstable, beta plus to D
Deuteron:	np	stable
Neutron-Neutron:	nn	unstable, beta minus to D
He-3:	pnp	stable
Triton:	nnp	unstable, beta minus to He-3
Triton-S:	npn	temporarily stable state because of neutrons' wandering!
He-4:	◆	stable n-p-n-p ring.

From the first bindings, we see that only **pn-bindings are stable**.

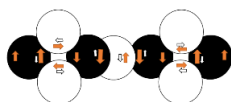
A **pp-binding has absolutely no chance** (diproton, He-2). It finds its end in beta plus process to pn.
 A **nn-binding only lives a certain time period** to end then after a beta minus process to a pn-binding. All these consequences perfectly fit with my model of neutron, helium ring and connections over the phenomenal rotation (hidden rotation movement at the inside).

He*-5:	◇n	unstable, n-emission
He*-6:	n◇n or ◇nn	unstable, n-emission or β^- to Li-6



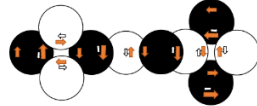
He*-7:	nn◇n	unstable, n-emission, beta minus to Li-7	
He*-8:	nn◇nn	unstable, 2 alpha links	
Be*-8:	◆◇	unstable, 2 alpha links, direct binding of alpha links leads to alpha radiation	1n/1p

Be-9:	◇n◇	stable, He-3 binding of both rings (p- n -p)	1.25n/1p
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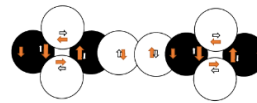
B*-9: $\blacklozenge p \blacklozenge$ unstable, proton binding (n- \bar{p} -n), beta plus 0.8n/1p
 The proton cannot give anything to the binding. Only both neutrons do so. If they are already involved, the binding is extremely weak. A fresh and unspent neutron is missing as it is given at B-10:

B-10: $\diamond np \blacklozenge$ stable, He-3 binding (p- \bar{n} -p) 1n/1p



B-11: $\blacklozenge pn \diamond n$ stable,

Be*-10: $\diamond nn \diamond$ unstable, n-decay 3n/2p



Be*-11: $\diamond nn \diamond n$ unstable, beta minus 1.75n/1p

Be*-12: $n \diamond nn \diamond n$ unstable, beta minus 2n/1p

B*-12: $\blacklozenge pn \diamond nn$ unstable, beta minus

C-12: $\blacklozenge pn \diamond np$ stable 1n/1p

You could now play “construction kit“ with it. One is sure, the relationship of the number of neutrons to protons isn’t a safe indication for stability of an atomic nucleus. **Only the structure is able to decide about it!** So I watched for all the possible couplings, which I don’t put into this book. I have created a large part of the appendix to my book as pdf file. What models you ever favors, in present one thinks at spherical nuclei. Causing this, scattering experiments are evaluated. Anyway, I think they don’t prove the sphere but certain densities, the mass density and the charge density. So I have reason enough to doubt it, especially when I look at the fission products of a nucleus.

One can see that the repulsion shifts the nucleons onto a linear chain. In its middle, the repulsion force is approximately zero while given symmetry of the chain links. But each proton that is escaping from the middle successively stands under more repulsion pressure. This leads to a certain pressure of tearing up! It doesn’t simply increase to the end of the chain. No, at a distance in deviation of the compensated middle, it increases strongly. Then in direction to both ends, it decreases.

My atom nuclei are cigars. Essentially, they have a rod-like shape. I call them chains because each He-4 link is one part of such a chain bound by proton-neutron bindings or only neutron bindings. So the chain link gets a shape of lithium links building up on both sides of a central helium-4 link (called alpha link or α -link) to a line.

For this reason, two neutrons can bind exactly at that alpha link’s both protons standing in the middle of the beginning nucleus. As soon as there appear new protons, they are sensitively located in the area of repulsion compensation. Already a small shift of this locations causes that both proton’s let themselves shift more to the outside. Fortunately, the binding energy is still large enough here at this location. Even neutrons can still bind there.

But I don’t see a small chance for a stable hold in the center of an atomic nucleus. If that were possible, the atomic nucleus could have a star-like shape with complete symmetry of four chains. The ends of the chains would strive to the corners of an imaginary tetrahedron. But the fission of nuclei is inconsistent with the thought of a sphere and a tetrahedron. Let’s make a ball of nucleons. And then we shoot a neutron on it. The probability of hitting this ball is the same at all positions. But why does the ball split *apart* from the center, *rarely* in the middle and *hardly* at the edge?

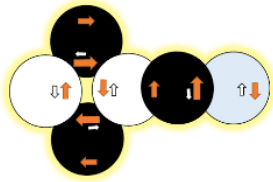
How does a single neutron actually cut such a number of nucleons apart? The common sense tells me: it’s impossible. The maxima of the mass numbers of the fission’s products are around 2:3. If we had a tetrahedron, the relationship would be 1:4. That’s an essential difference! So I say: In the case of a chain that is most stable

in the center and that builds up breaking pressure near the center, it can be divided in almost the expected ratio of 2:3. That supports the chain structure.

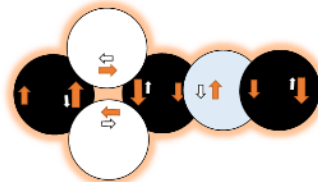
If we just had an order of four chains forming a tetrahedron, so we could only cut one arm from such a nucleus shape. Always three chains would remain in ratio to one chain. But two chains you cannot cut at the same time by one single neutron. *Consequently, in contradiction to the present measurement of scattering experiments, I favor a **stable and linear chain nucleus**. Just such a chain gives the possibility that one single neutron tipped the scales.*

By coupling the He-4 nucleus with a pn or a np – because an alpha link cannot couple with itself stably – the complete picture of a chain link of an atomic nucleus always appears as a He-4 in the center chained with Li-6 chain links. Li-6 is able to form two variants like it is to see above at the ideal carbon nucleus C-12:

Li-6 Type 1: ♦pn



Li-6 Type 2: ◇np



Using both chain links, single protons and neutrons as well as alpha links, the nuclide chain can be extended to an axis. So it is always in action to create a junction at the link 1 above and with a neutron below. The repulsion pressure prevents from this behavior in that case of an asymmetry on both sides from the middle He-4 nucleus. My rules are these as follows:

First: The tendency to form the chain is forced by the repulsive proton pressure.



Second: Neutrons prefer to hold onto protons, first of all those, which themselves have less binding energy. A massively strong center can be rather expected.

Third: A symmetry of masses is necessary, which only allows a small imbalance when you imagine a *nucleus rotating around its gravity center*. So a linear chain is preferred again.

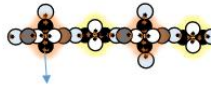
Fourth: Four neutrons can couple with an alpha link. If this will be made symmetrically and synchronously, the larger nucleus could grow like a tetrahedron. In the center of such a tetrahedron, the central alpha link is located. From this, four chains are running into the directions of the edges of that tetrahedron. This structure is only stable for a short line. I think of two nucleons.

Fifth: There always is a single unstable nuclide if the next neutron located at the edge or the end of the chain would hit at a further neutron of if it must do it immediately or later after its wandering. For example, already there is a neutron at this end and at the other ends a proton or a neutron. Then from reasons of mass symmetry, the neutron must wander to a neutron. Now the decay of beta minus is following.

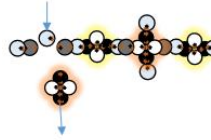
Sixth: After forming the next nuclide from a single instable nuclide, this new one applies new neutrons until there is nothing more to do. There are also unstable intermediate states by the reason of a structure that rarely allows beta minus decays or K-capture of electrons from shell while increasing mass number.

Seventh: Nuclei with the ratio of 1:1=n:p have no need in wandering neutrons. But in the case of wandering neutrons, created at the ratio of n:p>1:1, there are possible rarely contacts with neutrons starting beta minus processes.

Eighth: Alpha links on locations at both ends of the larger and strongly stretched chain will be then emitted when a neutron is asymmetrically located there:



The alpha link releases. The neutron inserts.

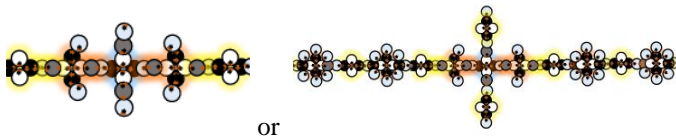


Ninth: If the chain will increase by mass extensively, so the danger of tearing increases although the neutrons bind protons and prevent them from repulsion (shielding).

Tenth: Bindings are stretched from the overlapping or their nucleons' horizons while increasing distance from each other. Binding energy of neutrons is decreasing. Probability of their fission is increasing.

Such a stretched nucleus is falling out of each other by spontaneous fission (U-235) preferred there where the repulsion pressure is strongly increasing from the center. This is the reason for an asymmetric decay that I can imagine best on a linear chain. The neutron cannot cut at will. It is not a knife! This is why I think that the *rotation of the nuclei around their gravity centers* leads to tearing the longer they become: spontaneous tearing of one part of the chain from the inner area, and induced tearing when one neutron will become to the decisive excess weight at one of both symmetrical chains.

Such a neutron hits the chain. By incoming neutrons, double neutrons are built. But they don't hold together. *At least*, the breakup takes along the second neutron to be emitted. While the fission at least 2 neutrons get free, the bound and the pushed out or some pushed out neutrons of the complete surplus of neutrons. Presently, one means to have recognized a mass ration of about 2:3 of 95:140 (6, p146). This almost ideally symmetric curve shows me the structure of a severed chain. In the center, it mostly holds together, there where it is breaking in very few cases. But right next to it, however, the probability of breakage strongly increases as if it would be an analogous graph. Every mass number is bound at the mass of a nucleon. If we turn this graph upside down then we see the strength of the central binding in the middle of the alpha link. As told above, nuclei of heavy isotopes hold tight short tetrahedral branches. In the center of an alpha link, it seems to be probable that the tetrahedral structures are extended leading to the alpha radiation, for example:

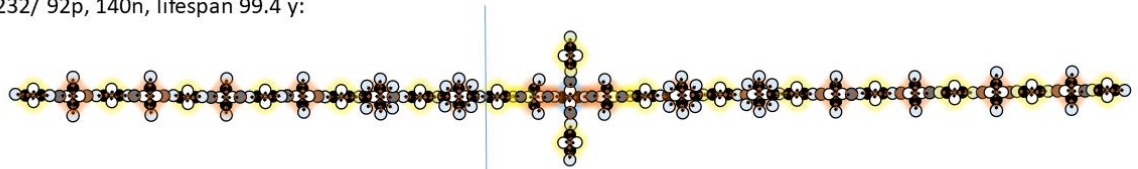


To the right and left of the center, the chain begins with both halves. The following neutron would be the first cleavage point, the first "predetermined breaking point". But it is still stabilized by the neutron ring around the area of the center. So the next predetermined breaking point after the lithium link will break most easily when it is kicked out.

Spontaneous Nucleus Fission: tearing by centrifugal force while rotating.

Nucleus fission is forced by a neutron. After this, a nn-binding follows, which cannot hold tight. Still before a beta-minus reaction is starting, three neutrons are falling out additionally the cutting neutron. At this position, the binding was extremely unstable by strongest repulsion of protons, which is symmetrically possible at a right or a left position from the center. The pulling effect of the centrifugal force now must tear or "split" the chain.

U*-232/ 92p, 140n, lifespan 99.4 y:



Kr*-90/ 36p, 57n, 3n escape:

Ba*-139/ 56p, 83n

For example, we take 2x 116 nucleons (232) on both sides of the chain. Now we are separating them as shown above at the neutron ring beneath the alpha link where neutrons come together – as shown by the arrow – then we have lost 23 nucleons from left: 93-3n, on the right, there are 23 more: 139 nucleons. If the alpha links will be split, then the exemplary ratio is 90:139.

Illustration 2.4: Distribution of Fission Products (6, p 146, from Germany)

Ausbeute % = Yield %; Massenzahl = Mass Number

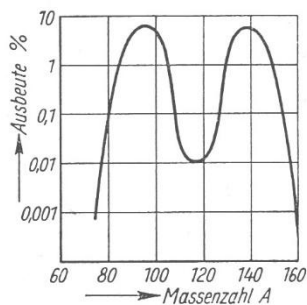
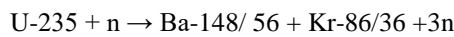
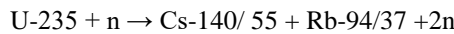
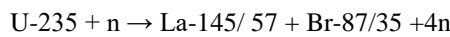
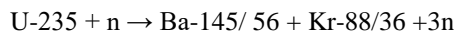


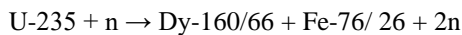
Bild 172
Häufigkeit der Spaltprodukte für thermische Neutronen

But this is a distribution, which can be derived by the structures I gave.

Well-known fissions of U-235 by neutrons for example are as followed:



Extrema on both sides of the chain for example are as follows:



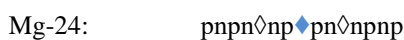
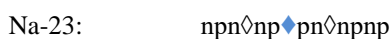
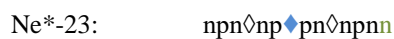
The repulsion is lowest in the center of a chain-like nucleus. Then it increases at each proton position up to the end of the chain. The nuclei can be expanded via alpha links and nucleons until they bind even more neutrons to the protons from starting with Ca-40.



So there could be two constellations how nuclides are able to build up by symmetrical lines.



We see clearly why only the isotope F-19 is stable.



an ideal symmetrical chain

Si-28:



Si*-31:



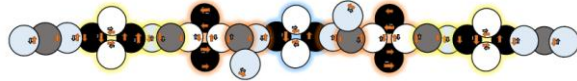
P-31: $n \diamond np \diamond pn \diamond np \diamond pn \diamond np$ P*-32: $nn \diamond np \diamond pn \diamond np \diamond pn \diamond np$

S-32: $pn \diamond np \diamond pn \diamond np \diamond pn \diamond np$



S*-35: $nnpn \diamond np \diamond pn \diamond np \diamond pn \diamond npn$ Cl-35: $pnpn \diamond np \diamond pn \diamond np \diamond pn \diamond npn$

S-36: stable by spatial symmetry of neutrons' distribution:



Cl*-36:



Ar-36:



Cl-37:



Ar*-39:



K-39:



K*-40:



Ca-40: $\diamond np \diamond pn \diamond np \diamond pn \diamond np \diamond pn \diamond$

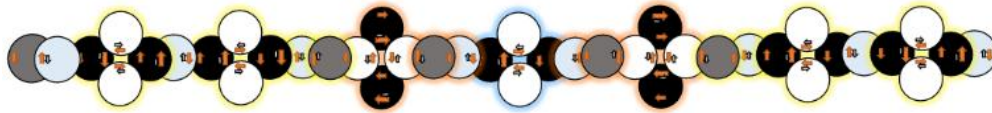
The charge density decreases to less than half compared to He-4.



Just here, I want to tell you something about the spatial relations: If Ca-40 would be a regularly tetrahedron, then I wouldn't know anymore where I should bind those 6 links at the He-4. A system only would be symmetrical by 4 or 8 links distributed on 4. Consequently, there would always only be divisibility by the number 4. *But* the magic numbers (2, 4, 8, 20, 28, 50, 82, 126) always and only are divisible best by number 2.

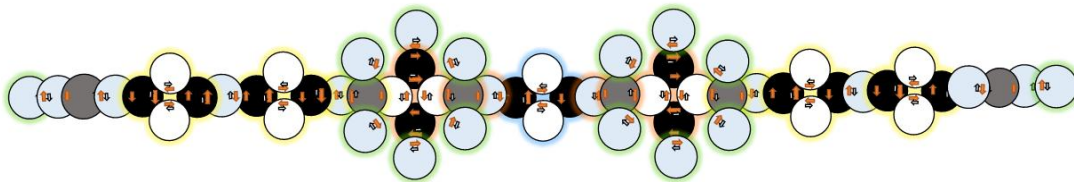
Therefore I stick to a nuclide chain that realizes 2 symmetrical sides or, which is in action to create them.

K-41:

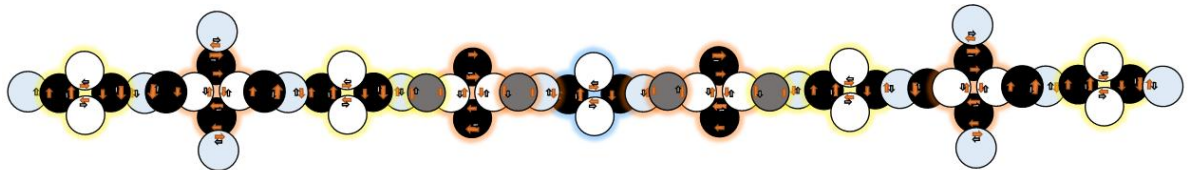


K*-42 makes Ca-42 etc. Ca-41 can change a proton to a neutron by a nucleus capture arising K-41.

Ca*-58 is an absolutely stressed nucleus by neutrons. I chose it to show formation of Fe-58:



Fe-58:



If we take away a neutron left and right, then we find the isotope Fe-56. We give an neutron to the right, so we find Fe-57. We already recognize how Fe*-59 will be arising. An edge neutron will be a case of beta minus decay! And so it continues. At Zr-90 we still see again an ideal chain that reflects the magic numbers of the nuclei for 40 protons and 50 neutrons. Sulfur 32 certainly had an unknown magic number of 32. It still is an ideally formed nuclide, too. Let us add 50 and 32 and we get the number 82, which is valid for the protons of the nuclide plumb-208.

In the end of the row of the stable isotopes is plumb, for example Pb-208 (82 protons, 126 neutrons). Pb*-209 already will decay into Bi*-209. With it, a row of up and down decaying natural radioactive nuclides is beginning. But how do we go the way getting an isotope of plumb? This can happen by energetically supported nuclear fusion at the ends adding other nuclei. Their ingredients take positions most symmetrically by nucleons' shift on the chain. If symmetry is not possible, there is a tendency to change neutrons or to emit nucleons and alpha particles.

But what is the principle to extend the hitherto 1:1 axes? I think that protons will be shifted to right or left outside. They are bound there with neutrons.

Could repulsion of protons be shielded by neutrons? As a rule, the magnetic fields can be shielded by surrounding the proton fields. So it also should be possible that the electrostatic charge can be reduced by neutrons because they have a lot of internal electric charges located into the electromagnetic field. If it would be true, then wandering neutrons in contradiction to protons would be less concentrated at the ends of the chain than in the center.

By Pb*-209 that has to bind a neutron with another neutron, we get now Bi*-209. After further decays of neutrons up to uranium, the ends of the chain are changing again into alpha links in the sense of Li-6 types. Protons

above and below the middle are worth together like one He-4. They cannot stay there. Alpha radiation is becoming the norm. Radon-220 decays into polonium-216.

Should the nucleus continue growing, it would form the nuclei of Fr, Ra, Ac and Th on this way.

Many neutrons are coupled at the protons and neutrons. Therefore, the formation is going on to Pa and U, which is the last natural element. All the other isotopes following them have to be made by much energy support on earth, for example they have to be generated artificially. Berkelium nuclei with too much neutrons and calcium nuclei are able to be merged. Science still speaks of “merging” expecting the “isle of stability”. From my structure model I draw the conclusion that it may have succeeded to set a Ca-nucleus into the middle where it could be bind in the center forming a single tetrahedron chain. Because on the outside there is nothing left to attach such a large imbalance. But in the center, there is temporarily a location of more stability by sensitive position of compensated repulsion. It is running well until the sensitivity breaks down this system. It doesn't help. There is no longer a sense searching for heavier isotopes being stable elements. If they existed, then they would have to be detectable in the spectra of the stars or different celestial bodies. My opinion is: They don't exist!

Uranium-235 can be split by one neutron. What is nuclear fission actually? The repulsion in the chain of the nuclide is balanced in the center or near the center of the nucleus. From there the pressure on the next protons increases exponentially in the direction to the external end of the chain to the right as to the left. Every chain, if shorter or longer, will be stretched by the internal pressure of repulsion, the shorter less than the longer. So on the longer chain, at their ends complete alpha links are split off. Additionally, repulsion pressure increases this way between the center, where it is against zero, and the first following protons.

Starting from the center, tetrahedral extensions aren't stable on short chains. When they tilt sensitively, they will be captured and cut off by the high final repulsion pressure. Alpha links can be emitted there. Only when the high final pressure of the chain has moved far left and right from the middle, the center is able to develop two short chain strands running up and down in our graphic. If they tilt a little from the balance, they aren't captured immediately by final repulsion. But they will wander to the tetrahedron. So I see short nuclides as chains, medium nuclides already with less central tetrahedral offshoots, long chains of plumb up to uranium and to the transuranic elements, but with longer tetrahedral offshoots. If they tip over, a nuclide has to become unstable. Also the ends of the longer chains are involved to emit alpha links.

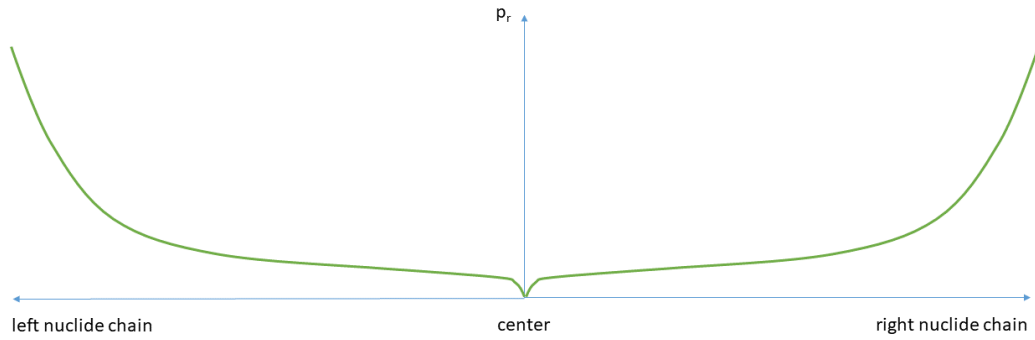
You can recalculate that with a calculation that I will safe here. I'm not a physicist but a philosopher. If you want to do it, please do it! You had to add all the single repulsive interactions of each single proton's position and calculate them against the other side ($F_x = F_{x-1} + F_{x-2} + F_{x-3} + F_{x-4} + \dots + F_{x-i}$). With each step of the position shift to the next proton, two forces from the other end of the repulsion are added. This shows that the very last protons in the chain on the left and right side no longer have any protection. So there is the highest internal pressure in the chain in the direction of emission to the outside. It is compensated in the center if the chain is symmetrical in terms of number and arrangement of protons. Already close to a symmetry, the differences lead to a successively increasing pressure by repulsion force.

It becomes clear why the nuclides of the fissile nuclei aren't most frequently split in the center but in the increasing repulsion. We watch into the middle of the approximately horizontal graph, then we find there the fission area of the greatest frequency of fission products in ratio of about 2:3. It can be seen clearly that an atomic nucleus should have internal symmetry. The more repulsion forces stretch the proton-neutron coupling, the less the binding nucleons immerse into each other, the less is their binding depth, the less is their binding energy, the less is their mass defect. Today in this science, everything is calculated crosswise as if every nucleon (proton as neutron) had the same amount. Real is that a neutron alone carries the binding energy. It is distributed then in the chain from strong central bindings at short chains to successively weaker bindings at longer chains.

You can find more graphic examples of structure's solutions of atomic nuclei in my attachment as PDF. There you also find some rules:

- Binding energy will be decreased by neutrons externally coupled,
- Maximal binding energies arise from ideal structures of a nuclide chain without an extension of a tetrahedron into the ordinate.
- Nuclide Ca-40 is the most ideal. It arrives the maximum binding energy per neutron.
- Neutron-neutron bindings are very weak. They just exist for a very short time period before they decay by beta-minus process into proton-neutron bindings essentially stronger.

Illustration 2.5: Repulsion Pressure p_r in a Nuclide's Chain



At this point I would like to visualize the rotation of an atomic nucleus using the example of Ca^*-41 . However, this image is idealized as it shows neither deviations nor the curvature of those two arms due to the centrifugal force. I just want to briefly indicate this with a second image that resembles the bar galaxy.

Illustration 2.6: Rotation of an atomic nucleus

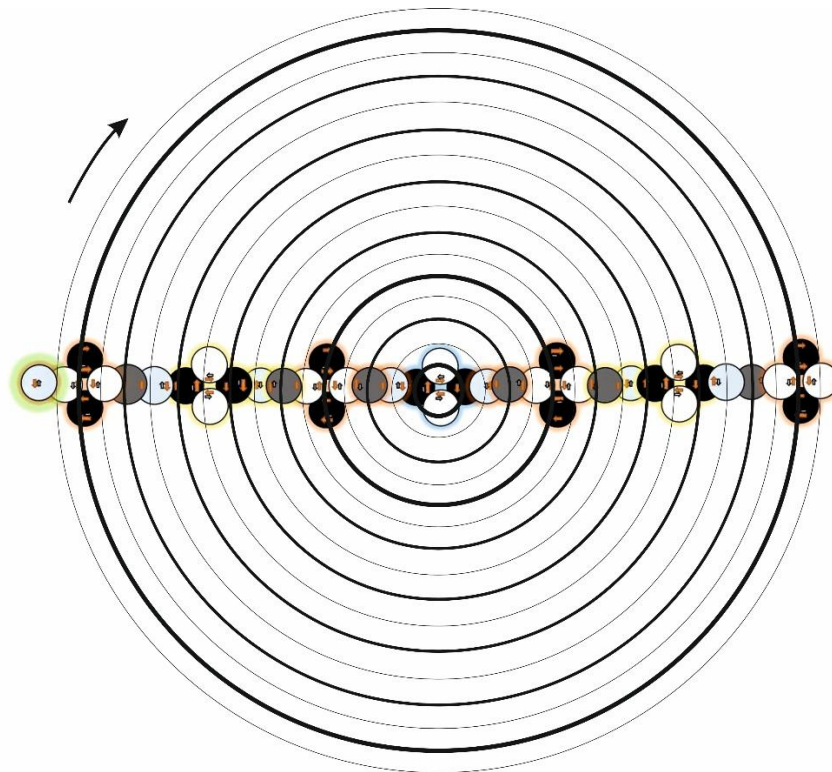
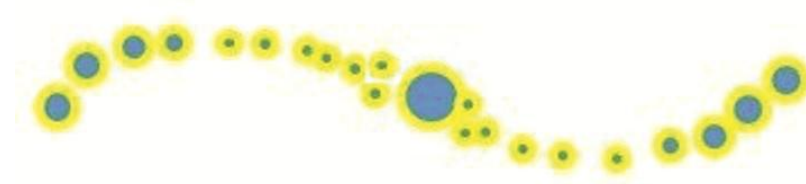


Illustration 2.7: Effect of centrifugal force



Magnetic properties of all the nucleons are balanced at all. Consequently, there must result a spin of zero. If there is no reason for rotation of the nucleus because there is no active e. m. field, this special nucleus cannot rotate like $\text{He}-4$, too.

Another neutron causes another magneton, and so an asymmetry of magnetic fields. The nucleus of Ca*41 had to rotate then. Protons on their orbits generate these 7 magnetons in Ca*-41 above illustrated by circles. Without rotation, Ca*-41 only had one single half-spin. Obviously measured were 7/2, relatively negative.

We made 7 circles of rotation of calcium: these stronger magnetons surely overwrite that small magneton of the neutron additionally appearing. Ca-42 is symmetrical with two border neutrons. It does not rotate. Ca-43 again gets an asymmetrical neutron-magneton that causes rotation and e. m. spin of 7/2. Spin of s=0 and no rotation fits to Ca-44. Unstable isotope Ca*-45 again has to rotate and cause 7/2 by its asymmetrical neutron. This turn goes on to Ca*-48. Symmetrical Ca-isotopes remain free of rotations based on balanced magnetons, so with spin s=0. Asymmetrical isotopes get strange negative spins of 3/2 or 5/2 beginning from Ca*-49. This is only explainable by the assumption that these isotopes probably will have built four tetrahedral arms. Rotating protons now will sit on common orbits. The number of previous magnetons will be reduced from 7 to 5 or 3. Such types of nuclei have a short lifespan.

Once more, now I want to explain quantitatively the binding energy that I already tried to cause by a hidden nucleon's rotation speed in my book TBA I (1). There in the rotating centers are the spaces merged from mass and radiation. Above, there are some e. m. protocosms and the space of only radiation. Newer measurements found results those forced me for need in changing of my citations from my own book TBA I, pages 541ff actually interpreted. All I marked with blue color, I corrected or added by my present knowledge.

„4.9. Atomic Nuclei

Today one thinks, nuclides would be ellipsoidal buildings similarly to the sphere by a pouring of nucleons where they all would stick together playing a „pion ball game“. Certain models favored a general rotation around the common gravity center by, which quantizing possibilities would be opened similarly to the electron shell. But nothing of this can remain correctly thinking of visible opinions since we had constructed the coupling of particles over their oscillation spheres. Nearly in fantastic manner before us, an atomic nucleus is opening that equals more a plant growing into the space ... than it equals a spherical body. The structures are comparable to an early step of chemical aliphatic substance structures ...”

„a) Mass Defect

Using the energy conservation law that is only valid for relative outsides, while the electrogravitational binding of cosms over their vacuum and their oscillation spheres (areas of radiation cosms), a **mass defect** $-\Delta m_{(n)}$ is appearing. It is derived from Einstein's relationship (2.4,16): $-\Delta E_{(n)} = -\Delta m_{(n)} \times c^2$. The rest energy E_{A_0} of the “neutron” as also of its rest mass m_0 with eq. (2.4,1e) are decreasing by the radiated binding energy amount $-\Delta E_{(n)} = |E_T|$: $E_{A_0} - \Delta E_{(n)} = (m_{A_0} - \Delta m_{(n)})c^2 = E_A \dots$ ”

”It's unknown from, which parts the binding energy consists. Therefore it was always referred to” each “nucleon.” But only a neutron emits its own parts.

A proton meets “a neutron ... Both nucleons immerse their vacuum spheres into each other to the overlapping of oscillations of the internal masses (see illustrations 4.6;1 and 4.6;2, p 515). ...“

Nucleons orientate themselves very much stronger after their elementary electromagnets – after their electric magnetons anti-parallelly. Elementary gravitomagnets are already big. They force a little to parallel orientation the deeper the nucleons immerse into each other. So a certain antigravitational repulsion results.

Nucleons vibrate between up and down inside the vacuum sphere (the radiation cosm). That they are prevented from falling into each other, their mass blocks have to rotate. In this way, the phenomenal rotation arises while magnetic orientations remain.

“Because a nucleon makes the electromagnetic and also the gravitomagnetic vector, each nucleon binding causes a tilting movement of the rotation areas” of the protocosms.

“Finally from this cohesion, the concrete binding energy depends, which must be added to a certain gravity level of 1, 2 or 3. Because of the binding angles δ_T of neutron’s rotation area caused by magnetic directions, the emitted energy can be adjusted very differently. This means: quantizing of magnets does not correspond to 1:1 of quantizing of gravitation, but it represents a very fine structure. Why? Because the elementary magnet $\bar{\mu}_0$ in analogy to \hbar is essentially smaller than each magnetons derived from it by the integer number n .

The external gravity center of the proton m_p ... immerses into the neutron.”

Every nucleon has a special angle position to another nucleon. The inside is constructed the same way. So the angle location or the position of the internal matter must influence the amount of the binding energy. This fact I tried to describe correctly in my TBA I.

Phenomenal rotation or hidden rotation is the rotation of mass blocks around their own axes. I imagine that the nucleon appears in the sky of the other nucleon. This will be the reason that it has to go around the sky completely. This orbit now has to lead to an internal rotation externally invisible. But the rotation may not change the intrinsic magneton externally measurable and constant. It is not allowed to cause less or more parts of rotation. To meet the requirement, the rotation that creates the electric magneton by its protocosmic rotation has to be decoupled from the protocosms of the mass block. So the bindings of magnets remain while small tilting. But the mass blocks are rotating what you externally cannot observe. In those days of the year 1998, I wrote:

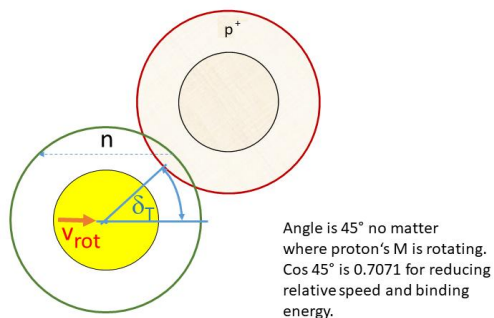
In this cohesion, each ... internal cosm rotates at its perimeter referred to the external cosm so that externally no rotation is visible ... By moving the proton at the sky of the neutron cosm now relatively to the rotating internal mass of the neutron M_n following (2.4,26), it gets its g. m. wave quantum energy $E_{w(p)} = m_p \times v_{rot} \times c$; $n = 1$; only for inner-cosmic relations (cf. section 4.9. b). It corresponds to a gravitational pair forming potency of a pion pair (280 MeV) following the calculation below by inclusion of the second nucleon. The relations are the same from the point of view of a proton. An observer would see the neutron running around the „proton sky“. Each energies acting at the inside of this relationship are kept at the inside. Because of α_2 external actions of that binding must be seen, too. While every nucleon is relatively in move to the inside mass of the other nucleon with its external mass being in this, it has to emit an energy amount necessary from movement calculated after the equation (2.11,21) to be a relativistic energy difference $\Delta E_{(n)}$ like at electrons, too.

We speak of the **Phenomenal Rotation** (cf. sections 2.4. and 4.6.)” *Now I speak of the hidden movement, too.* “No external observer can stop the internal movement relations. This way, the adjusted internal binding relationship remain with their binding energy of nucleons and internal rotations, otherwise an energy change would have happened by coupling of further nucleons or their separation when rotation relations are changed or finished. During this process, the positions of elementary magnets will be changed and the binding angle δ_T of the neutron to the proton will be shortened (binding energy increases) or enlarged, too.

Illustration 2.8: Binding Angles of Rotation Areas

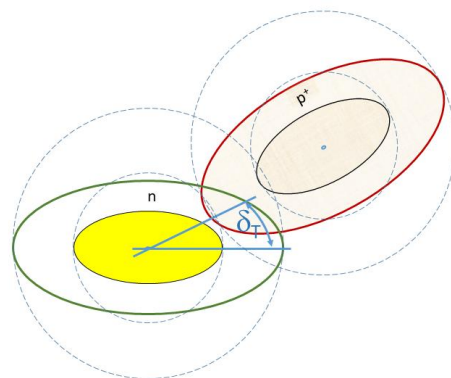
Binding Angle δ_T 2D

Observer is in the neutron



Angle between neutron rotation area and the proton lense immersing

Binding Angle δ_T 3D



Angle between neutron rotation area and the proton lense immersing

You see, if both angles are zero, the coupling is close to maximum energy and relative velocity.

A falling speed cannot have increased up to so much larger amounts reaching the protocosm velocity at vacuum light velocity c . The product of rotation velocity and rotation radius $v_{(n)} \times R'_{(n)}$ is almost constant for a common level n . In this respect, that nucleon has well reached the level of $n = 1$ without rotating at the amplitude R_N of the other nucleon. However, there it had to be moved with light velocity c . But with the velocity $v_{(n)}$ much below of c , the nucleon gets a larger relativistic distance. ...”

Proton and neutron would have the binding energy of E_T ... “While incoming of the top protocosms into the common sphere, which cycle takes about one pion period, the time period is given of about 3×10^{-23} s. In this cohesion, protocosms” still come to their evaporation. We don’t speak of average binding energy of a deuteron of each nucleon and of each binding (N+B), but now it just is still the binding energy of the neutron:

$$E_T = \Delta E_{(n)n} \cdot \tag{4.9,1}$$

$$E_{T(n)} = 2.225 \text{ MeV} / n$$

“Fundamentally, protons only make a favored unity with neutrons. A neutron pair as a proton pair, too, both carry their instability by a beta process. For neutrons a reduction was valid in the arbitrary relationship of $3n : 2p$ (wrong for He-5). When two neutrons and two protons are merged into a helium nucleus with cyclic structure, an ideal and stable relationship is adjusted. ...

It is impossible that alpha links would order themselves making a ring or even a spherical ball instead of a chain structure. Growing internal repulsion of protons pretends curvatures. Each small nucleus simply must be a branch aliphatically growing from its sensitive force center with side chains. If already a **marginal neutron** meets several alpha links, a proton can be built-in there, and the chain is growing up to the next nuclide.

Marginal neutrons are the first feature of neutrons, which is built-in next to the alpha links. With another neutron for nuclide, we find an isotope with a simply higher atomic mass number. If now another deuteron is built-in, the next alpha link is forming itself. Within the aliphatic cords, the protons are favored moving to the ends of the chain while the neutrons remain next to the center. They are the second feature of neutrons there: **internal neutrons**. ...

Because of the exchange of internal neutrons at different alpha links, the isotopes would be really be mixtures of differently structured nuclides of the same type. Concretely, these would be also **isomer isotopes** like they are well-known but explained differently by droplet model, shell model and wave-“quantum model”. Stable isotopes, too, can get into such a state coupled with a higher inside energy because of their internal change” by *neutron’s wandering*. “This energy will be emitted by gamma radiation on the way back of the structure. ...”

The external mass of a neutron of $939.57 \text{ MeV}/c^2$ decreases on $m_{n(3)} = 937.345 \text{ MeV}/c^2$ caused by its binding energy of 2.225 MeV . I marked it with the level 3 because it is the lowest energy level that I found. I think, it is correct. Its internal rotation areas cannot hardly adjust transversely that binding energy could be reduced by this state. But if it would be so, I had to start from a higher amount.

“Starting from the known amount of binding energy in $n = 3$, because of eq. (2.4,14) the corresponding phenomenal rotation velocity can be calculated ideally (cf. page 318):” Now I had to take the only binding energy of a neutron. But this doesn’t fit because after binding both nucleons are already bound. The exchange g. m. wavequanta. Each observer JOY1 and JOY2 watches his own part of the movement. Therefore we must include both, so the average of neutron nucleon and proton rest mass: $(937.345 + 938.28)/2 \text{ MeV}/c^2 = 937.8125 \text{ MeV}/c^2$:

$$v_{(n)} = c \cdot \{1 - [1 / (1 + E_T / E_{A0})^2]\}^{1/2} \tag{4.9,3}$$

$$v_{(3)} = c \cdot \{1 - [1 / (1 + 1.1125 \text{ MeV} / 937.8125 \text{ MeV})^2]^{1/2}\} = c \cdot [1 - (1 / 1.00118627)^2]^{1/2}$$

$$v_{(3)} = c / 20.54845282 = 14,589,539 \text{ m/s.}$$

We also are able now to conclude on the size of the levels 2 and 1 over n^2 . Multiplication by n^{-2} , especially by $1/9$, leads to the level $n = 3$ from, which we started:

$$n = 1 \quad E_{T(1)} = 9 \times 2.225 \text{ MeV} = \mathbf{20.025 \text{ MeV/n}} ; \quad v_{(1)} = c / 6.866 = 43,663,335 \text{ m/s;}$$

$$n = 2 \quad E_{T(2)} = 20.025 \text{ MeV} / 4 = \mathbf{5.006 \text{ MeV/n}} ; \quad v_{(2)} = c / 13.704 = 21,876,274 \text{ m/s;}$$

$$n = 3 \quad E_{T(3)} = 20.025 \text{ MeV} / 9 = \mathbf{2.225 \text{ MeV/n}} . \quad v_{(3)} = c / 20.548 = 14,589,539 \text{ m/s.}$$

“We find **idealized energy levels** just as if the deuteron wouldn't have any angle between its nucleons and as if all the nucleons would have found the same level. This equal treatment can only be valid for the deuteron ... Total special conditions are valid for all the other atomic nuclei. They are dependent on the binding angle. Energy level will be added in each the proton.

b) Binding Energy

A proton and a neutron make the level 3 in deuteron. ... If another nucleon comes in, the level 2 is forced between the coupling nucleons at triton and at helium (3). ... Finally, the fourth nucleon has found a ring formation of four nucleons forming the alpha particle in the level of 1. In this respect, the helium-(4)-link or the alpha link is the center of our observation. No other variant can reach the level of 1 inside the atom nucleus. It seem like each nucleon would push each other nucleon into the deeper energy of $n = 1$

At this position, we want to show that relative rotation speed of nucleons can be recalculated into wave energy by, which interesting results follow. On the inside, the gravitative wave energies $E_{w(1)}$ of 1s, 2s or 3s are active with the relative speeds of eq. (2.4,26) and (4.9,3). Their relativity is obviously not valid because of the phenomenal rotation on the outside, for example:“

$$E_{w(1)} = 136.68 \text{ MeV} , \quad \text{with } c / 6.866 .$$

Using around 136.7 MeV, so we come into the proximity of the wave energy potency of elementary pions, which have average of 137.3 MeV, formation energy about 274.5 MeV.

“The energy of about 300 MeV was already predicted by YUKAWA (1907-1981). That means: In the nucleon pair coupling, wave quantum levels are adjusting themselves (these are fallons), which are thought to be rest energy keys for a possible pair forming of mesons. For comparison, here are the rest energies of π -mesons:

$$E_{A0(\pi)} = 139.576 \text{ MeV} \quad (\pi^+, \pi^-) \quad E_{A0(\pi)} = 134.972 \text{ MeV} \quad (\pi^0). \quad (/Q 7a/, p 207)$$

With a quarter of energy of the level 2 and with the ninth of the level 3, pions cannot be designed directly. Pion resonance is not dependent on binding angles. We follow:

- The assumption of the present models, pions would be exchange "particles" of the nuclear force, we cannot maintain because we only see here exchange wave quantum actions in our theory. The wavequanta there neither equal the real pion particles nor they are in relationship, nor they are similar.”
- From TBA III resulted that lepton shifts possibly can be watched as “virtual pions”: $n = p + „\Delta^0 L^- + \Delta E”$. On this way, even numbers of nucleons can change themselves, preferably in alpha links. The neutron handed over its negative lepton shift $\Delta^0 L^-$ with Spin 0 and condensation energy ΔE to the nearby proton, which would be changed into a neutron without detours, and vice

versa. This process cannot run without order or chaotically.

- “Finally, the externally measurable wave energies do not act the nuclear force. Much more the nuclear force is the expression of the attraction of the internal mass of one nucleon with the external mass of the other nucleon and vice versa. ...

Scattering experiments of protons at beryllium plates of ${}^9\text{Be}$ proved neutrons by emission, which had the identical momentum of the shock protons. This fact couldn't be explained to be a shock with separation and exchange of nucleons from the structure of present atomic models, because otherwise the momentum complex would have changed. Therefore one expected the change of protons into neutrons by the "exchange" of "virtual pions" in the proximity of the nucleus. Obviously in the nucleus, neutrons would be immediately changed into protons and vice versa. Physics projected this mechanism at the energy-time-uncertainty (2.4,25). „Virtual pions" as so-called „exchange quanta", how „quantum mechanics" assumes, we do not know, but we only know the **exchange of wave quanta in the shape of interactions**.

In our theory the transmission of an electric charge by a wave quantum is impossible, because it is not a wave quantum itself but a primary quantum in the shape of a non-stationary black-white hole oscillating spherically and spatially. The wave quantum only can exchange the momentum. So it never can change the particle charge. Consequently, the proton cannot change into a neutron by a „virtual pion exchange“.

The shock proton meets a beryllium nucleus consisting of two alpha links added with a marginal neutron \diamond_n . Accidentally and seldom, internal structures hit into the structures of a neutron directly. In that process, $\Delta^0L + \Delta E$ may have been transferred from certain neutron to that scattering proton.

“And now let's go to the binding energies of the first nuclides:

- For the deuteron they are clear. ...“

From my last models I recognized by corrections the following statements:

- A neutron was bound at the proton of the deuteron creating the triton. Both neutrons now wouldn't have to rotate in the same speed. So both rotation areas could be adjusted in proton where the internal observer looks at both neutrons in the sky. In this way, both binding levels could be different. But angles always reduce the energy. Never they can increase them over the given maximum. So I only can assume 2 equal levels of 5.006 MeV/n (n=2). The sum is 10.012 MeV/T, reduced by the angle of about 32.1° down to 8.48 MeV/T.

- In the formation of helion – of a Helium-(3) nucleus – the proton meets a neutron in deuteron. It doesn't give anything to both nucleons, but it gets from the single neutron new energy. Also here, the neutron could have both different rotation areas for protons in the own sky. But it doesn't. No external cause is given. In contradiction to the triton, both protons repel themselves electrostatically. So the resulting energy has to be reduced by a larger angle. The lonely neutron in level 2 would give each 5.006 MeV to each of both protons. By the angle δ_T of 39.55° remain 7.72 MeV.

- In Helium-(4), nucleons create a cycle. Magnetic vectors orientate themselves in this cycle. This leads to the adjustment of binding angles where the areas have a theoretic angle of 45° to the area of the neutron. By this location, the relative rotation velocity and the binding energy will be decreased by the angle δ_T of 45° and the cosine to 0.7071.

Each neutron takes the level 3. Together it could emit 20.025 MeV, half and half per proton. One proton therefore would get 20.025 MeV. Emitting both amounts, 40.05 MeV/He-4 would become free. But in alpha, the angles have to be equal. With 0.7071 we get 28.32 MeV/He-4 close to the real amount of 28.296 MeV/ α .

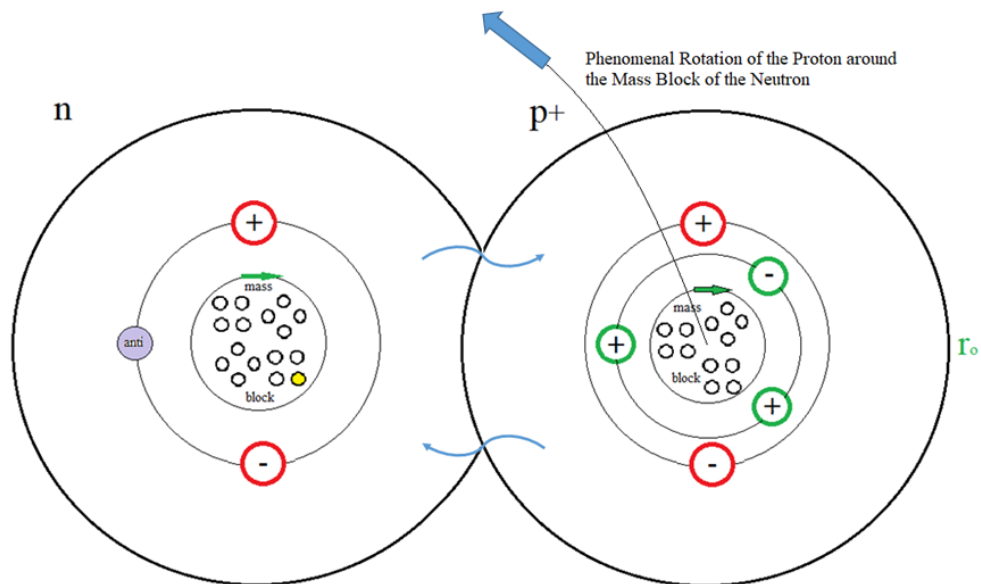
Each further coupling now can take different angles, but never 90° when as well as no binding energy would be possible. I think, it is the case of the trial to bind two alpha links directly.

In Ca-40, there are an average of 17.1 MeV per neutron. But there are 6 internal neutrons those hold bindings of alpha links together with these 6 internal protons. I think that these couplings surely have maximally 7 to 8 MeV per neutron like in triton and helion. I estimate, then less than 300 MeV would be distributed on 14 neutrons of the alpha links. Now I calculate more exactly: $280.35/14=20.025$). We get 20.025 MeV/n for 6.55 MeV/n in the chain as necessary for the level 1.

How can I better visualize the phenomenal rotation of the nucleons for you? Here is an attempt by illustration as followed.

The observer is sitting on the mass block of the neutron (left). There I marked the negatively charged electron protocosm in yellow that connects now three green marked protocosm from proton to the forth part of the neutron's mass block. In neutron, we find then 4 equalized quadrupoles, in proton only three. Two wave lines at the edge of the overlapping show the coupling and the direction of the electric magnetons of both nucleons. These areas creating the magnetons aren't rotating at all. They are tilting but there is no complete orbital.

Illustration 2.9: Proton rotates Phenomenally around the Mass Block of Neutron



Only the mass blocks are able to rotate correctly (green arrows above the mass blocks). This way, the other nucleon is prevented from falling in. It takes a phenomenal orbit, which I marked above by the big blue arrow. Because r_0 is an incidental horizon (so-called gravitational horizon of a Black Hole), the observer naturally cannot look into the proton. But the pulsations of the internal mass of the proton project the being of external mass. This is the reason that the contact is enough between internal neutron mass and pulsating surface of the incidental horizon of the proton to couple the external proton mass with the internal neutron mass where the observer is sitting.

Another observer in proton watches all the things reversed exactly. This is my kind of relativity.

Still don't understand? Then please, take place in a train! Imagine, the train has stopped and the forest would run past the window. This is relativity. The central neutron mass thinks that it would stand while the proton mass is rotating around. But real is that it itself is rotating while the proton stand still in the outside world.

But the outside world is separated from the incidental horizon. The external observer doesn't take notice of all the thing, which are working inside. These incidents, he cannot observe directly. Yes, this

is relativity. Some people who were already dissatisfied with Albert Einstein will now think about me: What a sh ... !!!

Regardless of this, I am convinced of my solutions and also of the angles between the nucleons. The equations (4.9,7) and (4.9,8) from TBA I are the basis here. I calculate now as followed:

$$\delta_T = \arccos [v_{rel(n)} / v_{(n)}] \quad \text{or} \quad \delta_T = \arccos (E_{T_{rel(n)}} / E_{T(n)})$$

And: $E_{T_{(neutron\ bound)}} = \cos (\delta_T) \times E_{T(theoretic)}$

Here is clear that the cosine of the angle δ_T of 90° reduces the relative rotation velocity and the energy to zero in the level of $n = 1$.

Now I offer you a graphic arrangement of possible atomic nuclei in this attachment to my book. A collection of nucleons and some atomic nuclei in PDF, you can find on my internet **blogs**.

Now I want to finish having given a suggestion for a new structural model of the atomic nucleus.

God bless you!

Index

- 1: “The Book Arcus I“ – Theoretical Opinions
from “Einheitliche Feldtheorie – Antworten auf die Weltfrage“ by Heinz-Joachim Ackermann, Pseudonym “Arcus“, published in Germany 1998 at Frieling Verlag, Berlin, self-translated version published by internet www.arcusunivers.com since 1998
- 2: “The Book Arcus II“ – Philosophical Opinions
from “Einheitliche Feldtheorie – Antworten auf die Weltfrage“ by Heinz-Joachim Ackermann, Pseudonym “Arcus“, published in Germany 1998 at Frieling Verlag, Berlin, self-translated version published by internet www.arcusunivers.com since 1998
- 3: My own website including some more of work by articles on <https://www.arcusuniverse.com>
There are a lot of further premises and hypotheses.
- 4: “Allgemeine Relativitätstheorie“, by Hans Stephani, published 1980, VEB Deutscher Verlag der Wissenschaften, Berlin, Germany
- 5: Wikipedia in the internet for all special publications of physical data
- 6: “Grundriß der Atom- und Kernphysik“, by Helmut Lindner, published in Leipzig a) 1963, b) 1981
- 7: “The Book Arcus III“ – “The Alternative Solution of the Problem of the Elementary Particles“, November 18th, 2020, published in internet under www.arcusuniverse.com

Declaration

On the basis of my own acknowledge and of the less information from the given literature as well as with the aid of irrefutable fundamental laws of the natural sciences and some research on the internet, I have created my work myself by proposed solutions within the framework of my own theories of the “Ideal Oscillator” and my own creations of new words. No other person has worked with me.

This product

The Book ARCUS IV

An alternative Suggestion to the Model of Atomic Nuclei

remains my sole private ownership. It is subject to international rules and laws of copyright valid for more than 70 years after my death.

On oath on December 9th, 2020.

A handwritten signature in blue ink, appearing to read "Heinz-J. Ackermann", followed by a long horizontal line.

Heinz-Joachim Ackermann, D-02828 Görlitz, Germany,
Pseudonym: Arcus