

## **The Alternative to the Standard Model**

### **The Nuclear Forces**

By

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As I have said in previous posts this Alternative Theory is based on the idea that mass is something tangible, which has been the thought of many eminent physicists until the Virtual Revolution invaded us. In 1934 the Japanese Physicist Yukawa thought of particles as small blobs of sub nuclear matter, that he called *urmaterie* and others called "goo". This sub nuclear matter or "goo" is the only material component of the Universe. Let us imagine material particles as small spheres, although we will see that this requirement is not necessary. The material particles are nothing but moving "goo". But Yukawa predicted a rotational movement, so that the material particles at rest would be turning "goo".

According to the Alternative Theory these blobs of "goo" are subject to a few simple rules and formulas that determine its performance. The electric character is expressed through electric rings rotating with the frequency of the particle. All particles are the same thing, rotating "goo", but mass and energy determine size and rotation frequency and magnetic moments determine size of electric rings and speed of its differential elements of charge.

The coexistence of electrical charges of opposite signs in the neutron is not a new idea. Let us quote P.T. Matthews, from the University of London, in his book "The Nuclear Apple": "The Yukawa model also implies that the electron charge of the proton, which is carried by the "goo", will not be concretised at a point but spread over a region of dimensions given by the nucleon radius. Since the proton is spinning, this charge will form small current loops which give it magnetic properties, although its total electric charge is zero. These predictions have been dramatically confirmed during the last ten years in a study of deflections produced in a beam of very high energy electrons by target protons."

So Yukawa's idea is that the "goo" turns and, the electric charge being distributed in some way, not at a single point, magnetic effects take place. Referring to the neutron, he makes the same point, but assigning a mixture of identical positive and negative charges to it. This Alternative Theory is similar in a certain way to that ideas of Yukawa, but it defines how electric charge is distributed in the particle, introducing the new concept,

that I consider fundamental, that electric charge always adopts the form of charge-rings, which turn with the corresponding frequency of the particle.

Yukawa mentioned magnetic effects inside the nucleus. He says: "Since the proton is spinning, this charge will form small current loops which give it magnetic properties, although its overall electric charge is zero. These predictions have been dramatically confirmed during the last ten years in a study of deflections produced in a beam of very high energy electrons by target protons".

I'll give you the simple rules and formulas that have led to this Alternative Theory. These rules and formulas are not the result of being searched at random and set out in order to check its accuracy. They are rather the result of a thorough analysis of experimental facts that necessarily lead to these formulas. The reasoning leading to the formulas of this Alternative Theory is based on an experimental fact that has gone unnoticed by modern physicists. The gyromagnetic ratio of a simple particle is  $M/q$ , where  $M$  is the magnetic moment and " $q$ " its spin. The unnoticed experimental fact is that the gyromagnetic ratio of the electron is  $e/m$ , where " $e$ " is the fundamental electric charge and " $m$ " is the mass of the electron.

On the other hand the gyromagnetic ratio for any punctual charge  $e$  with mass  $m$  is  $e/2m$ . That is to say, the gyromagnetic ratio is double what it would be if the distribution of mass and the distribution of charge followed the same law. This has been precisely the starting point of this Theory and this is the line of reasoning: the fact that the gyromagnetic ratio of the electron  $M/q$  is  $e/m$ , double as much as the normal value  $e/2m$ , shows that the electric charge of the electron is located so that it produces a magnetic moment bigger than the value we would obtain if the mass distribution and charge distribution followed the same law. In other words, the electric charge of the electron is somehow displaced towards the whirl equator. I shall present a new Post about this subject in a few days.

The main formulas of the Theory, referred to all simple particles, are:

- $E 2 \pi R = h c$
- Every differential element of the equator travels always at the speed of light. For the particle at rest:  $2 \pi R v = c$
- $E = m c^2 = h v$  ( $E = h v$  is a consequence of the above two equations)

Where  $E$  is the energy of the particle,  $R$  its radius,  $v$  its rotating frequency and  $m$  its mass. The particles are surrounded by rings of electric character which constitute the electric component of matter and turn with the particles to which they belong, following their own frequencies.

And that's it. Those simple ideas and formulas lead to a New Physics that can be understood by a child and also allows you to check a large number of experimental results, impossible to reach for an erroneous Theory.

And this is what happens concerning the nuclear forces: the magnetic effect can be greater than the electrical effect allowing binding magnetic forces overcome electrical repulsion forces. This can only be checked if the demonstration with its unquestionable numbers is properly analyzed.

Once these concepts and simple formulas of the Alternative Theory are accepted, all data concerning the material particles and their behaviours are determined. And these data and behaviours have to confront the experimental reality. With the assurance that any blatant mismatch will force to reject the Theory.

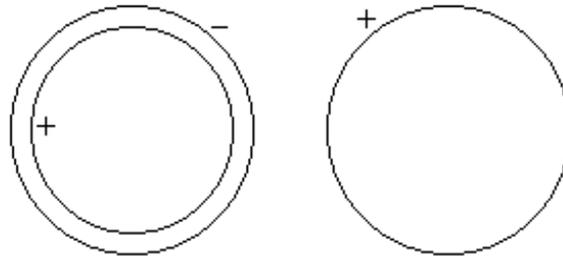
From here I invite the reader to check all coincidences of this Alternative Theory with experimental reality. There are many and some of them are definitive by themselves, without having to go to the others. You can see them in previous post here entitled "The Standard Model is wrong". Moreover, I can say to the reader that the objections that have been made, after strenuous efforts by the Establishment, have been absolutely inconsistent. See Chapter 13 entitled "Objections to this Theory" of the Book "A New Physics for a New Millennium". This Work has a Certificate of Registration issued under the Seal of the United States Copyright Office – The Library of Congress in accordance with title 17, United States Code.

The simple formulas above lead us to a definition of all material particles, since we know mass, energy, magnetic moment and spin. Here comes the first problem: the spin of all small blobs of sub nuclear matter suggested by Yukawa, whatever their mass and energy, must invariably be  $h/4\pi$ . This should have been an insurmountable obstacle I've talked enough about, but one of the matches I have called definitive. After that I should mention all data deduced for simple elementary stable particles (we shall see that the neutrino does not exist at rest), which are shown here.

	<b>Particle radius in fermi</b>	<b>Charge-rings radius in fermi</b>	<b>Charge-rings speed</b>
<b>Proton</b>	$R_p = 0,2103$	$R_{+p} = 0,3514$	$V_{+p} = 1,6709 c$
<b>Neutron</b>	$R_n = 0,2100$	$R_{-n} = 0,3586$ $R_{+n} = 0,2100$	$V_{-n} = 1,7073 c$ $V_{+n} = c$
<b>Electron</b>	$R_e = 386,23$	$R_{-e} = 386,23$	$V_{-e} = c$

Note the size of proton and neutron, next to a fermi. Otherwise this Theory would be immediately discarded. But first I want to point out that the neutron has two concentric electric rings, in agreement with Yukawa's ideas, the outer one with negative charge and the inner one with positive charge, its magnetic moment being negative and its electric

charge being zero. As I have said, in order that the Theory may go ahead it is necessary, on the one hand, that the dimensions of the circular electric currents and those of the corresponding particles be coherent, and on the other hand, that the positive electric ring of the proton does not differ much from the outer negative ring of the neutron.



Otherwise great problems would arise when dealing with the nuclear framework. Note that there is complete coincidence between the two radii for the electron. The particle equator coincides with the electric ring. This leads us to believe that there exists a certain tendency in Nature to make the equator of the whirl, which always travels at the speed of light, and the electric ring to coincide. Recall that the lengths of these two radii come from totally unrelated to each other experimental data. The mass on the one hand and the magnetic moment by the other. Is not it strange that with such different backgrounds the results for the electron are the same? This is where the Principle of this Alternative to the Standard Model Theory is. Because this strange effect is due to the fact that the gyro-magnetic ratio of the electron is  $e/m$ , double as much as the normal value  $e/2m$ .

There is coherence, on the one hand, between the dimensions of each particle and those of its corresponding charge-rings and, on the other hand, between the positive charge-ring of the proton and the outer negative ring of the neutron, which are practically equal in size. These coincidences are completely necessary. Without them the Theory could not explain the nuclear framework and the nuclear forces. As a matter of fact I must say that, if the experimental values of the three fundamental particles' magnetic moments were not precisely what they are, this Theory could never have been worked out. And, if it had been worked out, it would have incurred great blunders and, of course, the summit of the Theory's checking, which is the measurement of nuclear forces according to experiment, would not have been carried out.

If one analyses this subject rigorously one will reach the conclusion that the experimental values of nucleons' magnetic moments determine certain circular electric currents created by turning charge-rings, which will allow us to understand nuclear forces. If the values of the nucleons' magnetic moments were different, there would be no explanation for these forces. In other words this Theory would not exist and the nature of nuclear forces would remain an enigma.

The reader should remember that this whole approach concerning the charge and mass distribution in the proton and neutron, with known values of energy, mass and magnetic moments, is supported by an irrefutable fact: all this lead us to a binding energy of proton and neutron equal to 2,21 MeV, which completely coincides with the experimental result. It is true that this check requires some calculations. I can ensure that the calculations are correct, despite its complexity. We are measuring forces between electric charges located well below a fermi ( $10^{-13}$  cm) distances. The electric effect is enormous but the magnetic effect is much greater because the charges are moving above the speed of light. These calculations are laborious, but they are nothing compared to the Pharaohic CERN experiments. They are complicated but easy to implement and, as I have said, they are obtained through partial results of the forces by modifying the relative positions of proton and neutron, results that must be consistent between them. There is no room for error.

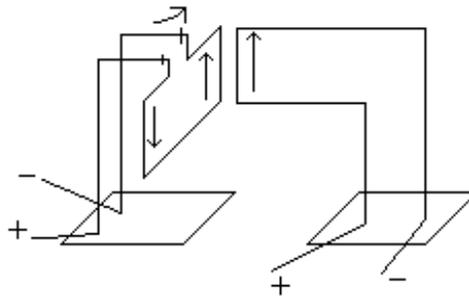
### **Binding of Nucleons** **Forces between charge-rings**

This Theory proposes that the turning charge-rings are the intermediate step between mass energy  $E = m c^2$  and electromagnetic radiation. Any change from one kind of energy into the other implies a modification of the frequency and the radius of the particle as well as the size of the charge-rings. We must therefore think that, if there is neither absorption nor emission of energy nor energy transformation, the charge-rings are not modified; we can consider them as rigid. We could explain in this way the fact that the two charge-rings of the neutron can coexist. If they cannot be distorted and the forces acting between them are symmetrical, those forces cancel out. The condition for that is that the charge-rings are located on the equatorial plane. On analysing this point, one should consider that the Nature designed and worked out the neutron with such precision that the charge-rings were exactly located on the equatorial plane of the particle. Let us consider that the neutron is a key piece in the constitution of the Universe. We have already said that the neutron may be considered as the cement which allows cohesion of atomic nuclei. It is an evident fact that the formation of atomic nuclei has been designed following the idea of accumulating positive charges in the nucleus, that is to say, protons. But it is also an evident fact that this union of protons requires, for one reason or another, the presence of neutrons. In other words, neutrons are the joining cement of protons. And it is also a well known fact that, in general, the greater the number of protons, the more cement is needed, that is to say, more neutrons. All this will be duly explained by the new Theory.

Nuclear forces consists of electromagnetic forces created between turning charge-rings, which accompany the elementary particles. But before we start studying the forces existing between nucleons, we shall analyse first the electromagnetic behaviour of electric charges on the macrophysical scale. We shall then be in better conditions to

understand the phenomenon on nuclear scale. Let us first consider the simplest case, when the directions of charges are parallel. The experiment on macro-physical scale could be the one known as "Ampere's squares", consisting in a device as depicted in the next figure.

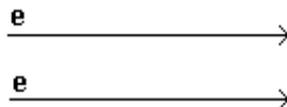
The left square can turn and the one on the right hand side is fixed. The result is that parallel currents cause attraction and antiparallel currents cause repulsion. The electric force is constant whatever the direction of the currents may be as far as the current intensity is not modified. The direction of the currents does not affect the electric forces as the current intensity passing through the left square is the same in both directions.



Let us now see the magnetic effect of the currents: When the currents are parallel, the sign of the charges being the same, as they are moving electrons, the magnetic effect is attraction. It can be seen in this way how two parallel electric currents cause attraction and two antiparallel electric currents cause repulsion. The electric effect is the same whatever the direction of the currents may be, but the magnetic effect depends on the direction of the currents.

And now let us go to the experimental world. If we have two electric charges of the same sign and absolute value "e" moving on parallel lines in the same direction at speed

$V = K c$ , as this speed is always lower than the speed of light,  $K$  is less than 1.



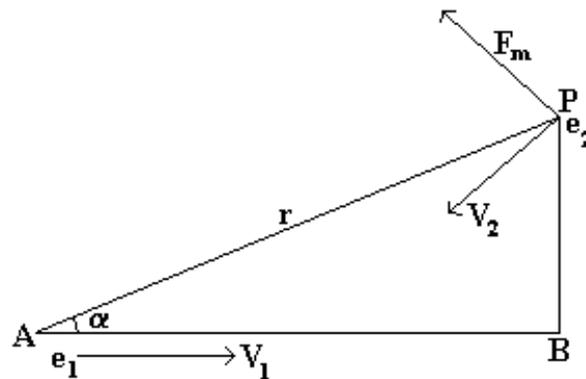
As the two charges are moving on parallel lines, the total force will be of repulsion and its value will be,  $r$  being the distance between the charges,

$$F = \frac{e^2 c^2}{r^2} (1 - K^2)$$

Since the speed of the charges is lower than the speed of light, electric repulsion overcomes magnetic attraction. If the particles carrying the electric charges reached the speed of light,  $K = 1$ , would be the limit case. Then the force would disappear. The electric effect would be compensated by the magnetic effect. If we supply the electrons with sufficient energy to get very close to the speed of light we could consider, with no appreciable error, that the limit case would have been reached. The speed of light has been measured with great precision in this way.

What would happen if electric charges travelled faster than light? It could happen that the magnetic effect would overcome the electric effect. Well, **this is the underlying principle of the nuclear forces.**

Before we start studying the behaviour of particles endowed with these charge-rings let us remember the electromagnetic laws ruling moving electric charges: let us imagine an electric charge  $e_1$  moving at speed  $V_1$ , as is shown in the figure.



We know that this electric charge  $e_1$  originates a magnetic field in the surrounding space, so that the intensity of that magnetic field at any point P is perpendicular, on the one hand to the direction of movement AB, and on the other hand to the joining line between the point where the charged particle is located, that is to say point A, and the considered point P of space. So the intensity of the magnetic field created on point P, as a consequence of the movement of charge  $e_1$  passing through point A, is perpendicular to AB and AP. It is therefore perpendicular to the plane on which the figure has been depicted. If we call B the intensity of magnetic field at point P, we know that its absolute value is

$$B = \frac{e_1 V_1 \sin \alpha}{4 \pi K_m r^2}$$

$\alpha$  being angle PAB,  $r$  the variable distance AP and  $K_m$  the fundamental electromagnetic

constant.

Let us now consider that there is another electric charge  $e_2$  on point P, moving at speed  $V_2$  in any direction but within the same previously defined plane. We have depicted any direction in the figure by the vector marked  $V_2$ . Charge  $e_2$  being located at a point in which the intensity of the magnetic field is  $B$  and moving at speed  $V_2$ , is submitted to a force, we shall call  $F_m$ , of absolute value  $F_m = e_2 V_2 B$ . This force is perpendicular on the one hand to the direction of the magnetic field at point P and on the other hand to the direction of movement of the charge  $e_2$ . It is therefore contained within the same previously defined plane and its direction is the one depicted in the figure, perpendicular to the movement of  $e_2$ . The direction of the force follows a simple rule, according to the electric signs of charges  $e_1$  and  $e_2$ . Substituting values, we have that charge  $e_2$  is affected by a force of magnetic nature, in the direction shown in the figure, with value

$$F_m = \frac{e_1 e_2 V_1 V_2 \sin \alpha}{4 \pi K_m r^2}$$

On the other hand there is an electric force between charges  $e_1$  and  $e_2$  in the direction AP, the sign of which depends on the signs of the electric charges and its value is

$$F_e = \frac{e_1 e_2}{4 \pi K_e r^2}$$

$K_e$  being the fundamental electrostatic constant. I shall use the electromagnetic system of units, in which the unit of charge is the fundamental electric charge with value  $1,602 \times 10^{-20}$  cr, where 1 cr is equal to 10 coulomb. In this system of units

$$K_e = \frac{1}{4 \pi c^2} ; K_m = \frac{1}{4 \pi}$$

I shall also use the CGS systems of units throughout the whole Work, except for nuclear energy, where I shall use eV and its multiples, MeV and GeV.

We have, as a consequence of the existence of two moving electric charges, that charge  $e_2$ , moving at speed  $V_2$ , is affected by the electric charge  $e_1$ , moving at speed  $V_1$ , through two forces, one magnetic and other electric with the directions established above and absolute values

$$F_m = \frac{e_1 e_2 V_1 V_2 \sin \alpha}{r^2} ; F_e = \frac{e_1 e_2 c^2}{r^2}$$

If we call  $V = k c$ , we have

$$F_m = \frac{e_1 e_2 c^2}{r^2} k_1 k_2 \sin \alpha ; F_e = \frac{e_1 e_2 c^2}{r^2}$$

Electric force is not affected by the charge speed. On the other hand, magnetic force

depends on the speed of both charges. We can establish the following:

- 1- Magnetic effect is of attraction when the signs of the charges and directions are the same. If both things, signs and directions, are opposite, there is a double change and finally the force is attractive. Only in the case that one of the two things, either signs or directions, is opposite, will the magnetic effect be repulsive.
- 2- Electric effect is greater than magnetic effect for speeds lower than the speed of light. If the speed of moving charges in parallel direction is equal to the speed of light, both effects cancel out. If the moving charges travel faster than light, magnetic effect is greater than electric effect. We are ready to analyse our case of charge-rings, with their differential elements of charge travelling at the speed of light or even faster, based on the above statements.

It is natural that if there is attraction between two rings they join together, which means that their circumferences come into contact.

When two circumferences become tangent, let us see how this can happen. We know that the magnitude of the electromagnetic forces is inversely proportional to the square of the distance between the charges causing these forces. It is clear that the maximum electromagnetic force between two differential elements of charge will occur when the two elements coincide in space. Then distance is zero and the force between these elements, whether attraction or repulsion, will be infinite. But the charge of the elements in contact is infinitesimal, what leads us to an indeterminacy of the product of something which tends to infinity by something which tends to zero, with a final determined result. This Theory solves in this way the problem of electric charges of opposite signs in contact. This is clearly understood when we consider that the only carriers of electric charge are rings, with their special features.

When we think of two charge-rings in contact through one single point of each ring, the real fact is that there are two infinitesimal elements of charge in contact which produce maximum effect. Near this point of contact there are other differential elements of charge, very close to that point, the effects of which have great magnitudes as distances are very short. It is obvious that it is precisely what we could call the contact zone which really determines whether the final effect between the two electric rings is of attraction or repulsion, as the effect in the whole zone has the same sign.

I know that, in order to make the calculations properly, what has to be measured is the total electromagnetic effect of all differential elements of charge of one of the rings upon every single differential element of charge of the other ring.

What is important now is to establish that, if the infinitesimal elements in the tangent zone determine an attractive electromagnetic force, the effect between the rings will be of attraction, and if the electromagnetic force determined by those infinitesimal

elements in the tangent zone is repulsive, the effect between the rings will be of repulsion. But let us remember that the electromagnetic force is the result of an electric component and a magnetic component. Let us also remember that the speeds reached by the differential elements of charge of nucleons are higher than the speed of light and consequently, as we have seen before, the magnetic effect is greater than the electric effect. The result is that the behaviour of the charge-rings in contact depends on the magnetic behaviour, not on the electric one, of the differential elements of charge in contact. In order to see the direction of the whole effect, we could consider that these differential elements of charge are two charges moving in parallel direction with their respective characteristics of speed and electric sign, although the distance between them tends to zero.

We have already seen that the effect between electric charges moving on parallel lines is such that there is magnetic attraction only when their electric signs and moving directions are the same or when their electric signs and moving directions are both opposite.

The conclusion is that two charge-rings with one point in contact are subject to attraction forces only in two cases:

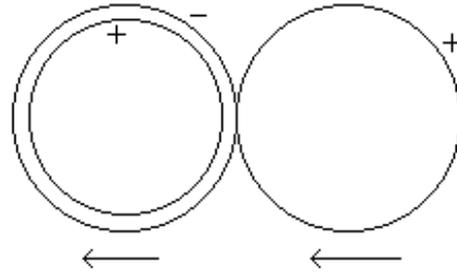
- 1 - When the electric signs are the same and the turning directions are opposite.
- 2 - When the electric signs are opposite and the turning directions are the same.

Therefore, if any of the above conditions are accomplished, the two electric rings will come into contact, even if their electric signs are the same.

Let us imagine now that two electric rings come into contact. We have considered till now that the planes of the two rings were coincident. The reason for that is that the particles are real magnetic dipoles which only allows up or down positions. The spins of joining particles will be parallel or antiparallel.

The superiority of the magnetic effect over the electric effect is due to the fact that differential elements of charge travel faster than light. Otherwise, the electric effect would be greater than the magnetic one. This is the case regarding leptons, and among them the electron, which do not respond to strong nuclear forces. The reason is that their electric rings do not exceed the speed of light. So leptons do not participate in strong nuclear forces. This is a privilege of hadrons, which can be mesons and baryons.

As it has been said before, we will consider a deuteron as a proton and neutron with their electric rings located on the same plane, turning in the same direction, so that one single point of each of the exterior rings come into contact. At this point of tangency differential elements of charge of opposite signs are faced and they move in opposite directions. As I have said before these conditions imply attraction.



To calculate the binding energy of the deuteron we separately measure the electric force and the magnetic force exerted by each of the differential elements of charge of the positive proton ring with each of the differential elements of charge of the positive and negative rings of the neutron for a determined position of distance between the proton and the neutron. So we obtain a resulting force for each position. By modifying the position we obtain the results shown in the figure at the end of this writing. Clearly, the calculations are not included in this paper, but I invite the reader to do the math, in the assurance that, if he perseveres he will abandon forever the ideas of the Standard Model.

The first value of  $d$  corresponds to a distance between the nearest points of rings  $0,7125 - 0,71 = 0,0025$  fermi. At that distance rings are nearly tangent. The last value of  $d$  is  $1,71$ , so that the distance between the nearest points of the two rings is  $1,71 - 0,71 = 1$  fermi. We can see that, at that distance, the force is negligible, equal to  $0,04 e^2 c^2 10^{26}$  dyne. Negligible as compared to the rest of the calculated values.

The energy being equal to a force multiplied by a distance, the binding energy between the particles will be the force multiplied by the distance corresponding to that force. As force varies with distance, the binding energy will be  $\int F_T dx$  where  $x$  is the minimum distance between rings.

In other words, binding energy will be equal to the sum of the partial products of the force, for each position of the particles, multiplied by the differential element of distance. This means that the binding energy is the area limited by the coordinates axes and the curve force-distance. We can see that the integral we are looking for, which will give us the binding energy of deuteron, is

$$\frac{3,0705}{2} \frac{e^2 c^2 10^{26}}{10^{13}} \text{ erg}$$

Factor  $10^{13}$  in the denominator comes from introducing distance, which must be measured in centimetres. The factor for changing from erg into MeV is  $10^6 / 1,6019$ . So the above expression given in erg must be multiplied by this factor in order to have it in MeV.

The result is:

$$\frac{3,0705 \times 1,6019^2 \times 8,9874 \times 10^{20} \times 10^{26} \times 10^6}{2 \times 10^{40} \times 10^{13} \times 1,6019} = 2,2103 \text{ MeV}$$

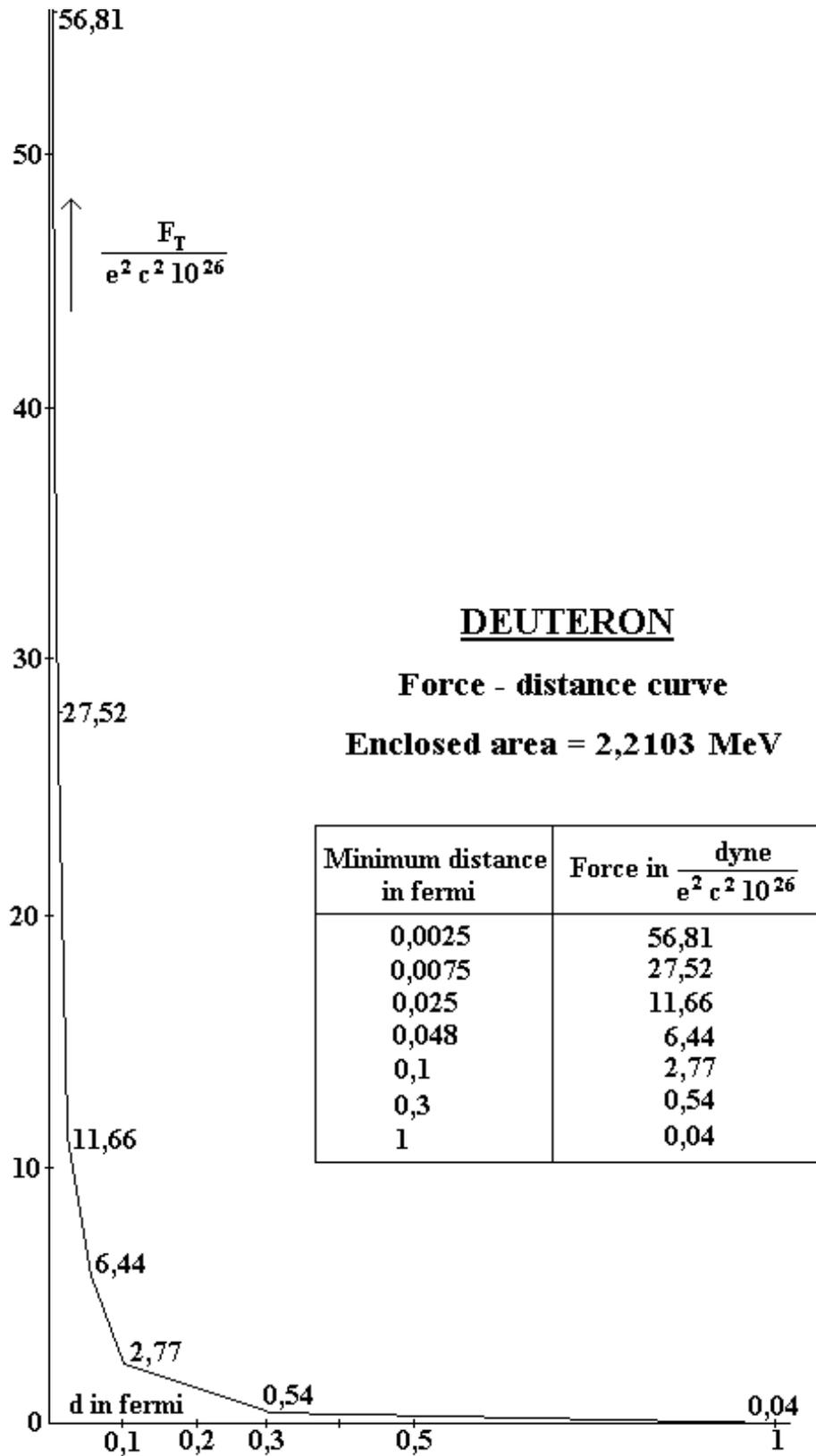
I have taken:  $e = 1,6019 \times 10^{-20}$  and  $c^2 = 8,9874 \times 10^{20}$ .

Can anyone believe this? That all this supposition of electric rings, whose dimensions and velocities are given by experimental data of magnetic moments, and this reasoning may lead to such a special result, with powers of 10 totalling 52 in the numerator and 53 in the denominator? Anyone thinking with a minimum of objectivity admitting that the calculations are correct should only accept that material particles consist of the small rotating blobs of sub nuclear matter or "goo", as suggested by Yukawa, subject to two simple formulas with electric rings that rotate with the same frequency.

If the problem is to check the calculations, what does this mean compared to the grand spectacle created by "CERN" and its Higgs boson and all the paraphernalia that goes with it?

The curve is shown in the next figure on page 13.

The reader can be sure that he will not have another "rational explanation" of nuclear forces. The issue is so complex that it cannot be more than one correct explanation, the true, and any other explanation is doomed to failure, unless you resort to virtual particles as intermediary acting between particles when the action of forces takes place. There is no particle intermediation either for nuclear or forces gravitational. Whoever doubts should check the correctness of these calculations: a final exact result with powers of 10 equal to  $52 + 53 = 105$ . This last fact should be thoroughly thought by the Scientific Community.



Ended: March 2014