

# The Aspin Bubbles proton (V2)

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**Abstract:** In the current version 2 of this article we incorporate all the modifications that we have introduced in the Aspin Bubbles project<sup>[1]</sup> and we mechanically build the proton particle and its antiparticle. The proton structure is very simple: two positons in a circular orbit around a negaton. As we will see in the article, we encounter perfect mechanical machines that meet and comply with all our knowledge on proton and antiproton.

**Key words:** Aspin Bubbles, anharmonic waves, positon, negaton, ton.

## 1. Introduction

Let us make a brief summary of the behaviour of the Aspin Bubbles ether and matter<sup>[1]</sup>.

The ether is a continuous and isotropic fluid. The ether fills all physical space and does not displace itself. Tons (matter) are immersed in the ether and disrupt it.

The ether modifies its elastic properties when the waves of the tons pass through it, in such a way that frequency and amplitude make it reduce its elasticity. As a result, the propagation velocity of the electromagnetic waves that run through the ether decreases and is lower than the speed of light.

The anharmonic pulsation of the tons membrane produces contractions and expansions in the ether that propagate at the speed of light. The ether is elastic and reproduces the asymmetrical movement of the ton membrane. It has an inertial non linear behaviour. Therefore, we have anharmonic longitudinal spherical waves that propagate through space and that are supported by the ether. Once the ether polarizes the tons are self-propelled through it due to the waves emitted by other tons.

In the case of the positon, contractions are stronger than expansions and in the case of the negaton it is the opposite. This is the reason why we state that tons polarize the ether through a wave field and why we have associated this behaviour with the classic concept of electric field. In order to understand the interaction existing between any two tons, we drew an analogy by assuming that the positon acts like a compression pump that hardens the ether and that the negaton acts like a suction pump that softens the ether.

The mechanical interaction produced in the ether between an anharmonic wave and a particle (ton) is simply electrical force and, thus, the force of gravity<sup>[2]</sup> is just a residue of the existing electrical forces between two neutral matters formed by tons.

Thus, we are not before static ether, but before dynamic ether configured through the existence of the tons that constitute matter. It is easy to imagine the force lines of the electrical and gravitational fields drawn in this ether.

The wave propagation velocity decrease in the proximity of matter led us, for instance, to the fact that light curves itself when it is close to the Sun<sup>[3]</sup>.

It is also easy to imagine that Earth transports its own gravitational field; the ether, which fills everything, is configured with the displacement of the Earth. We have dynamic ether. This is the reason why the result of Michelson-Morley's experiment is correct. The aberration of light, or stellar aberration, as well as other physical phenomena are easily explained under this new approach.

And inside the matter, space among bound tons, the ether is very much configured (disrupted), which is the reason why refraction of light is produced. And if matter moves, the ether configuration produced by the matter tons moves too. This is the reason why Fizeau proved with his experiment of the speed of light passing through moving water that the speed of light is variable depending on the matter that it passes through and on its speed.

In addition, in our approach we stated that all tons spin around a diameter producing a new disruption of the ether; rotation involves a constant intrinsic angular momentum  $\mathbf{S}$  respect to its centre of mass called  $\mathbf{S}$  spin angular momentum. The ether must have certain viscosity, which is why the rotation of tons stretches and tightens its surrounding ether, propagating this behaviour at the speed of light. Thus, we were able to interpret the concept of magnetic field as a measure of the stretching and tightening of the ether (Biot-Savart Law). Therefore, this stretching and tightening of the ether also led us to interpret the displacement of tons with a velocity (Lorentz magnetic force)

Adding the two following hypotheses:

1<sup>a</sup>) One negaton  $B$  not bound with other tons and with speed  $v$ , perforates the ether turning leftwards. Its vector  $\mathbf{S}$  has the same direction, yet the sense is opposite to its trajectory,

2<sup>a</sup>) One positon  $A$  not bound with other tons and with speed  $v$ , perforates the ether turning rightwards. Its vector  $\mathbf{S}$  has the same direction and sense as its trajectory,

we generalise the Biot and Savart Law in this way:

$$\vec{\mathbf{B}} = \frac{\mu_0}{4\pi} \frac{ev}{\vec{r}^3} \hat{\mathbf{s}} \wedge \vec{\mathbf{r}} \quad (1)$$

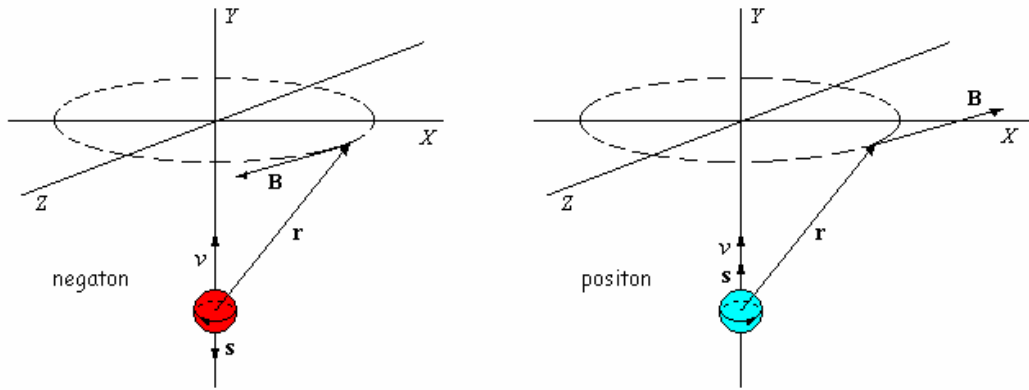


Figure 1.- Biot and Savart Law

where the produced vector magnetic field  $\mathbf{B}$  was the magnitude that determined the characteristics of the ether, stretched, tightened and addressed by the ton at a point in space located at an  $\mathbf{r}$  vector distance, which has a velocity  $v$  and where the direction and sense of vector  $\mathbf{S}$  is represented by the unitary vector  $\hat{s}$ .

And for Lorentz magnetic force we said:

A ton with velocity  $v$  in a stretched, tightened and addressed uniform ether  $\mathbf{B}$  will be subject to a force  $\mathbf{F}$  the value of which is:

$$\vec{F} = ev \hat{s} \wedge \vec{B} \quad (2)$$

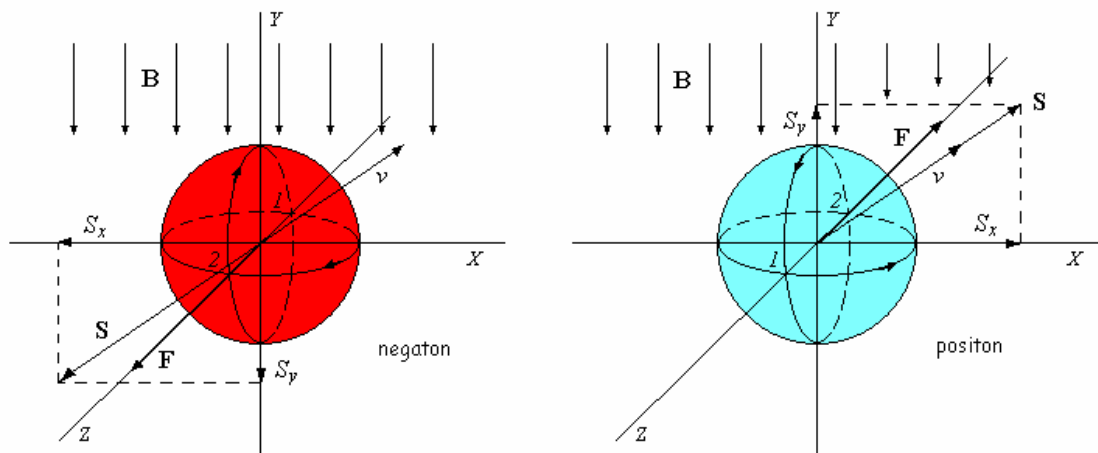


Figure 2. - Lorentz magnetic force

The reason for this relationship was as follows: According to the figure above, we can always decompose vector  $\mathbf{S}$  of the ton in the plane determined by  $\mathbf{S}$  and  $\mathbf{B}$  into two components;  $\mathbf{S}_y$  parallel to field  $\mathbf{B}$  and another  $\mathbf{S}_x$  perpendicular. The component  $\mathbf{S}_y$  perpendicularly stretches and tightens the ether  $\mathbf{B}$  equally in all directions, so there is balance. However, the perpendicular component  $\mathbf{S}_x$  stretches and tightens more the ether in the direction and sense of  $\mathbf{B}$ . The membrane, in its rotation, stretches and tightens more the ether  $\mathbf{B}$  on the side that rotates in the direction and sense of  $\mathbf{B}$  (side 1 of the ton), whilst on the opposite side (2) ether  $\mathbf{B}$  loosens. Hence that the ether more tightened on one side than on the other produces a force  $\mathbf{F}$  that we measure through the relationship (2). The tons are self-propelled in this anisotropy of the ether producing the magnetic force of Lorentz  $\mathbf{F}$  (2).

Although we have not explained it until now, the tons have a spin magnetic moment  $\vec{\mu}_S$  which has the same direction and sense as vector  $\mathbf{S}$ . Hence that we have to modify the orbital magnetic moment  $\vec{\mu}_L$  which produces a ton with velocity  $\vec{v}$  in a circular trajectory which orbital angular momentum is  $\vec{L}$  as follows:

$$\vec{\mu}_L = \frac{e \cdot \vec{L}}{2 \cdot m} \cdot (\hat{s} \cdot \hat{v}) \quad (3)$$

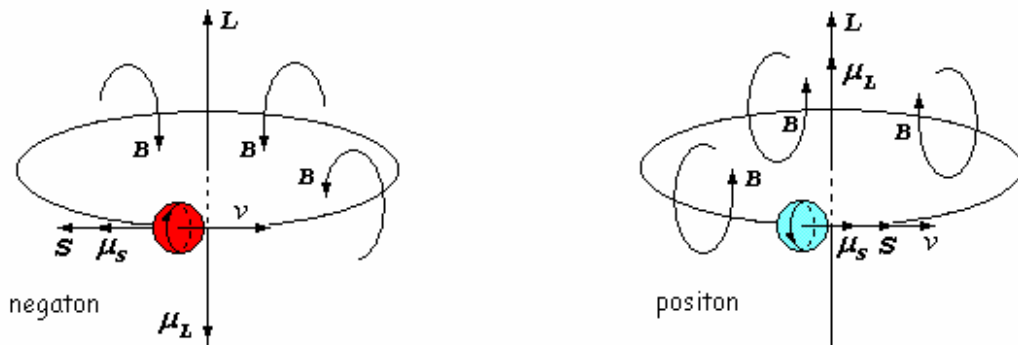


Figure 3. - Magnetic moment of a loop

where the factor  $(\hat{s} \cdot \hat{v})$  is the scalar product of the unitary vectors of vector  $\vec{S}$  and velocity  $\vec{v}$ .

The negaton, with its rotation and according to (1), tightens the ether inside the trajectory downwards producing in the loop a negative magnetic moment  $\vec{\mu}_L$ . And it is according to the expression (3)

$$\vec{\mu}_L = \frac{e \cdot \vec{L}}{2 \cdot m} \cdot (\hat{s} \cdot \hat{v}) = \frac{e \cdot \vec{L}}{2 \cdot m} \cdot 1 \cdot 1 \cdot \text{Cos}(180^\circ) = -\frac{e \cdot \vec{L}}{2 \cdot m} \quad (4)$$

as the angle formed by vectors  $\vec{S}$  and  $\vec{v}$  is of  $180^\circ$ .

In the case of the positon, the angle formed by vectors  $\vec{S}$  and  $\vec{v}$  is of  $0^\circ$ , and therefore the magnetic moment  $\vec{\mu}_L$  is positive. The rotation of the positon tightens the ether inside the trajectory upwards producing in the loop a positive magnetic moment  $\vec{\mu}_L$ .

Later we shall see, in the construction of particles, the use of the factor  $(\hat{s} \cdot \hat{v})$  when the tons are forced by the magnetic fields (tightened ether) causing vectors  $\vec{S}$  and  $\vec{v}$  to form a determined angle between each other.

## 2. Modifications made in Aspin Bubbles<sup>[1]</sup>

Although it is not an actual modification, the Aspin factor, causing the asymmetry of the forces between tons to achieve gravity, can be simplified obtaining the following:

$$Aspin_i = \sqrt{1 + 2H_i + \delta_i} \cdot 2 \sqrt{H_i(H_i + 1)} = \sqrt{1 + H_i} + \delta_i \sqrt{H_i} \quad (4^*)$$

We had calculated that a rotating hollow sphere of radius  $r$  with constant spin angular momentum  $\vec{S}$ , and with a unit of electrical charge  $e$  distributed uniformly throughout its entire surface, produced the following spin magnetic moment  $\vec{\mu}_S$ :

$$\vec{\mu}_S = \frac{e \cdot \vec{\omega}_S \cdot r^2}{3} \quad (5)$$

where  $\vec{\omega}_S$  was the angular velocity.

The tons are pulsatory hollow spheres where the radius  $r$  of the membrane is subject to the following expression:

$$r = r(\omega t) = (r_0 + A_0 \sin[\omega t])^x \quad (6)$$

And considering that:

$$\vec{S} = I \cdot \vec{\omega}_S \quad \text{and} \quad I = \frac{2}{3} \cdot M \cdot r^2 \quad (7)$$

where  $I$  is the moment of inertia of the ton membrane, replacing in (5) we will obtain that the spin magnetic moment is:

$$\vec{\mu}_S = \frac{e \cdot \vec{\omega}_S \cdot r^2}{3} = \frac{e \cdot \vec{S}}{2 \cdot M} \quad (8)$$

$M$  being the passive mass of any ton which is the amount of mass of the membrane.

We have found that the absolute value of the spin magnetic moment  $\vec{\mu}_S$  of any ton with mass  $m$  is:

$$\vec{\mu}_S = \frac{g_{AB}}{2} \cdot \frac{e \cdot \vec{S}}{m} \quad (9)$$

where  $g_{AB}$  is a new gyromagnetic coefficient, which value is:

$$g_{AB} = 1,009640492374899.... \quad (10)$$

The definitive relationship existing between the active mass  $m$  of a measured ton and the passive mass  $M$  of its membrane is obtained by equalling the expressions (8) and (9), which is:

$$m = g_{AB} \cdot M \quad (11)$$

(in Aspin Bubbles<sup>[1]</sup>, we said that the relationship was 2).

Later we shall see the essential role of this coefficient in the construction of the proton and of any particle formed by tons and the way to obtain it. The proton is the basic particle of all matter.

In a subsequent article we will demonstrate that it is possible to obtain Einstein's relativity formulas (distance, velocity and acceleration) by making a small change in the wave-ton mechanical interaction when the ton has some velocity. We will also consider the structure of the photon and the Compton effect. These three facts have implied some important modifications in the hypotheses (22) and (23) of Aspin Bubbles<sup>[1]</sup>, which remarkably improve the results for the particle size. These modifications are as follows:

1<sup>a</sup>) The mass  $m$  of a ton does not vary with velocity, but if we increase its velocity in a particles accelerator its internal energy increases due to an excitement factor  $\tau$ , that is:

$$E_i = \tau \cdot m \cdot c^2 = \frac{1}{2} \cdot h \cdot \nu = \frac{1}{2} \cdot \hbar \cdot \omega \quad (12)$$

2<sup>a</sup>) And this internal energy  $E_i$  is the maximum kinetic energy  $T$  of the membrane when it is in its balance position  $R_i$  and its velocity  $\nu$  is maximum ( $\nu_M$ )

$$T(R_i) = E_i = \frac{1}{2} \cdot M \cdot \nu_M^2 \quad (13)$$

If  $\tau = 1$ , we obtain Einstein's equation  $E_i = m \cdot c^2$ , only valid for particles at rest or with some velocity which have not been excited according to Aspin Bubbles.

The equations (11), (12) and (13) imply that the definitive radius of the membrane of a ton  $i$  in balance position is:

$$R_{i1} = \frac{\hbar}{m_i \cdot c} \cdot \sqrt{\frac{g_{AB}}{2 \cdot \tau_i}} \cdot Aspin_i \quad (14)$$

which replaces the boundary condition (30) of Aspin Bubbles<sup>[1]</sup>.

Finally, in order to be able to calculate correctly and numerically the parameters  $\{r_0, A_0, x\}$  of the movement equation of the membrane (6) of the ton which determines its dimensions, it is necessary to modify the boundary condition (25) of Aspin Bubbles<sup>[1]</sup> by simply replacing the mean radius  $R_i$  with the radius of the balance position  $R_i$ .

With these modifications, the mechanical interaction  $F_{ij}(d)$  of the anharmonic wave  $i$  over ton  $j$  or in other words, the electric force  $F_{ij}(d)$  exerted by ton  $i$  over ton  $j$  separated by a distance  $d$  is:

$$F_{ij}(d) = \delta_i \sqrt{\frac{\tau_i}{\tau_j}} m_i a_j \frac{R_{i1} R_{j1}}{d^2 - R_{j1}^2} = \delta_i \delta_j \frac{Aspin_i}{Aspin_j} \frac{k e^2}{d^2 - R_{j1}^2} \quad (15)$$

where the unitary charge  $e$  is simply a positive constant with the following value:

$$e = R_{i1} \sqrt{\frac{\delta_i m_i a_i}{k}} \quad (16)$$

### 3. The proton

The proton has three tons, two positons  $A$  in orbit around a negaton  $B$ . The masses  $m_A$  of the positons are equal. The mass of the negaton,  $m_B$ , is different. Consequently, the positons have the same pulsation frequency and are in phase, and the negaton has a different frequency (see 12). A view of the proton at different special instants seen from above would be as follows:

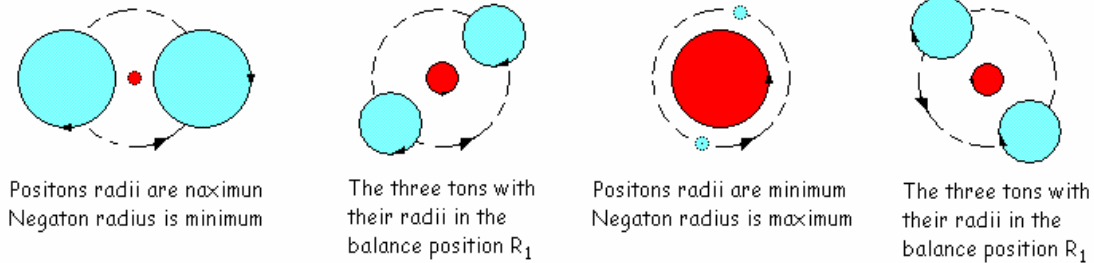


Figure 4. - Sequence of the proton

In this sequence of proton instants, both the size of the tons and their orbital radius are not to scale. We will subsequently see the real value of their maximum and minimum radii, that of their balance position  $R_1$  and their orbit.

#### 3.1 - Calculation of the masses

In the decay of the neutron in proton plus electron plus antineutrino

$$n = p + e + \bar{\nu}_e \quad (17)$$

we consider that the neutron and the antineutrino, as they are neutral particles, have the same amount of positonic and negatonic mass. Applying the mass conservation law we shall obtain:

$$\text{for positonic mass } A \quad \rightarrow \quad \frac{m_n}{2} = 2 \cdot m_A + \frac{m_\nu}{2} \quad (18)$$

$$\text{and for negatonic mass } B \quad \rightarrow \quad \frac{m_n}{2} = m_B + m_e + \frac{m_\nu}{2} \quad (19)$$

$$\text{subtracting both equations} \quad \Rightarrow \quad 0 = 2 \cdot m_A - m_B - m_e \quad (20)$$

and taking into account the definite structure of the proton, its mass is:

$$m_p = 2 \cdot m_A + m_B \quad (21)$$

thus, resolving the system of equations (20) and (21) it is finally obtained that:

$$\text{the mass of the positons is} \quad \rightarrow \quad m_A = \frac{m_p + m_e}{4} \quad (22)$$

$$\text{and the mass of the negaton} \quad \rightarrow \quad m_B = \frac{m_p - m_e}{2} \quad (23)$$

Note that the mass of the negaton  $m_B$  is almost twice the mass of the positons  $m_A$

$$\frac{m_B}{m_A} = 2 \cdot \frac{m_p - m_e}{m_p + m_e} \cong 2 \quad (24)$$

### 3.2 - Binding forces

Schematically, the forces existing in the proton's structure are represented in the following figure:

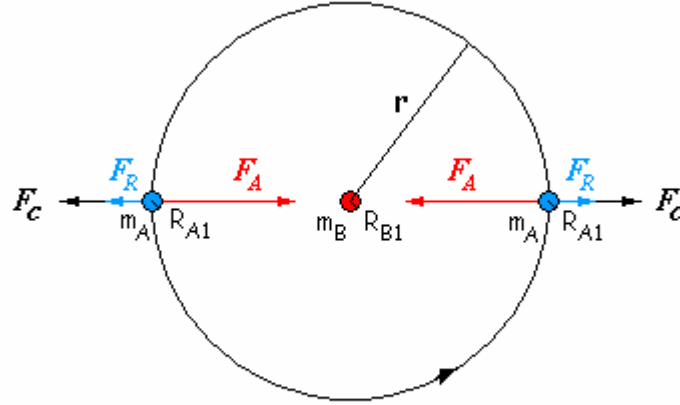


Figure 5. - Binding forces

Applying the mechanical wave-ton interaction (15) we have:

.- The attraction force that negaton  $B$  exerts over positons  $A$

$$F_A = F_{BA} = \delta_B \cdot \delta_A \cdot \frac{Aspin_B}{Aspin_A} \cdot \frac{k \cdot e^2}{r^2 - R_{A1}^2} = - \frac{Aspin_B}{Aspin_A} \cdot \frac{k \cdot e^2}{(x^2 - 1) \cdot R_{A1}^2} \quad (25)$$

where we change the variable  $x = r/R_{A1}$

.- The repulsive force that positons  $A$  exert among each other

$$F_R = F_{AA} = \delta_A \cdot \delta_A \cdot \frac{Aspin_A}{Aspin_A} \cdot \frac{k \cdot e^2}{(2r)^2 - R_{A1}^2} = \frac{k \cdot e^2}{(4x^2 - 1) \cdot R_{A1}^2} \quad (26)$$

.- The centrifugal force due to the orbital movement of the positons

$$F_C = \frac{L^2}{m_A \cdot r^3} = \frac{n^2 \cdot \hbar^2}{m_A \cdot r^3} \quad (27)$$

taking into account that the positons have an orbital angular momentum in absolute value  $L = n \cdot \hbar$ , where  $n$  is a number to calculate.

At all times it is complied that  $-F_A = F_R + F_C$ . Thus, simplifying we obtain the following equation:

$$\frac{Aspin_B}{Aspin_A} \cdot x^3 \cdot (4x^2 - 1) - x^3 \cdot (x^2 - 1) - \alpha_0 \cdot (x^2 - 1) \cdot (4x^2 - 1) = 0 \quad (28)$$

where  $\alpha_0 = \frac{n^2 \cdot \hbar^2}{m_A \cdot R_{A1} \cdot k \cdot e^2}$ . In this equation our unknowns are  $x$  and  $n$ .



### 3.3 - Orientation of the angular momenta S

In the construction of the proton we have to achieve that the magnetic fields produced by the tons have the same direction than their spin angular momenta, that is, momenta and fields have to be aligned. Applying the generalised law of Biot and Savart (1) we have obtained the following:

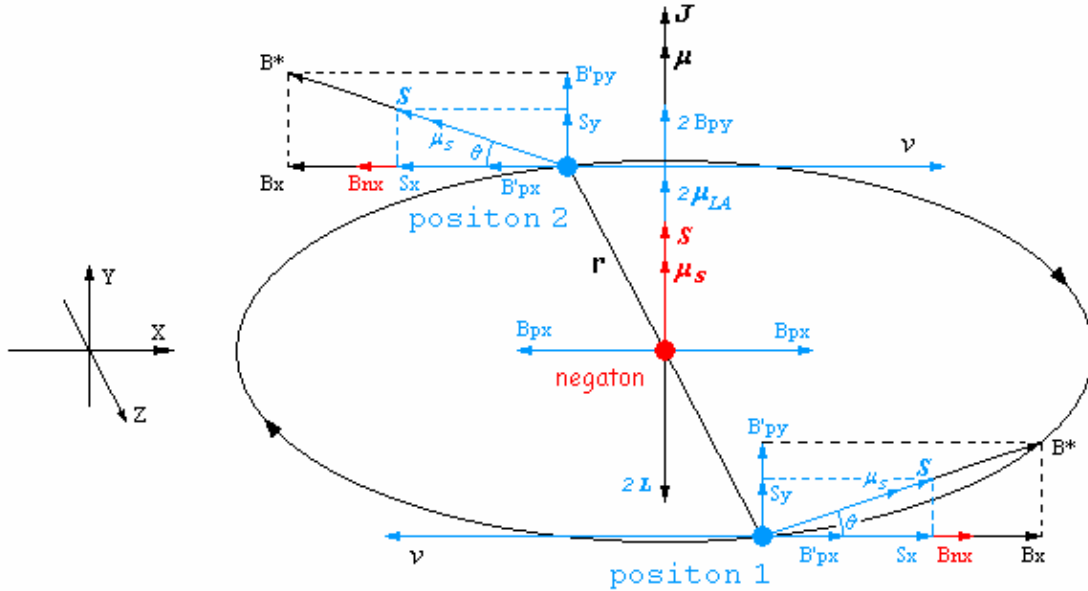


Figure 6. - Aligement of fields B with spin angular momenta S

- The spin angular momenta  $\mathbf{S}$  of positons 1 and 2 are inclined upwards regarding their orbit forming an angle  $\theta$  with the direction of their velocities  $v$ .
- We decompose vector  $\mathbf{S}$  of the positons in their components  $\overline{S_x}$  and  $\overline{S_y}$ .
- The rotation components  $\overline{S_x}$  of positons 1 and 2 create in the negaton equal magnetic fields upwards, which module is

$$B_{py} = \left| \frac{\mu_0}{4\pi} \frac{ev}{r^3} \hat{s}_x \wedge \vec{r} \right| = \frac{\mu_0}{4\pi} \frac{ev}{r^2} \text{Cos}(\theta) \text{Sen}(90^\circ) = \frac{A}{r^2} \text{Cos}(\theta) \quad (29)$$

being the unitary vector  $\hat{s}_x = \hat{s} \cdot \text{Cos}(\theta)$  and noting  $A = \frac{\mu_0 ev}{4\pi}$  (30)

- The rotation component  $\overline{S_x}$  of positon 1 produces an upwards magnetic field in the positon 2 the value of which is

$$B'_{py} = \frac{A}{4r^2} \text{Cos}(\theta) \quad \text{as the distance between them is } 2r \quad (31)$$

- The rotation component  $\overline{S_x}$  of positon 2 produces the same magnetic field in positon 1.

.- The rotation  $\vec{S}_y$  components of the positons produce opposite magnetic fields in the negaton the values of which are

$$B_{px} = \left| \frac{\mu_0}{4\pi} \frac{ev}{\vec{r}^3} \hat{s}_y \wedge \vec{r} \right| = \frac{\mu_0}{4\pi} \frac{ev}{r^2} \text{Sen}(\theta) \text{Sen}(90^\circ) = \frac{A}{r^2} \text{Sen}(\theta) \quad (32)$$

being the unitary vector  $\hat{s}_y = \hat{s} \cdot \text{Sen}(\theta)$

.- The rotation  $\vec{S}_y$  components of the positons create fields in their opposite positons, the values of which are

$$B'_{px} = \frac{A}{4r^2} \text{Sen}(\theta) \quad \text{as the distance between them is } 2r \quad (33)$$

.- Lastly, the rotation of the negaton, vector  $\mathbf{S}$ , creates fields on the positons the values of which are  $B_{nx} = \frac{A}{r^2}$ .

In light of the above, if we look at fields  $B_{nx}$  y  $B'_{px}$  they have the same direction and sense, which is why the positons will undergo a resulting field

$$B_x = B_{nx} + B'_{px} = \frac{A}{r^2} + \frac{A}{4r^2} \text{Sen}(\theta) \quad (35)$$

and the vector addition of fields  $B_x$  and  $B'_{py}$  result in  $B^*$  field vectors which are aligned with vectors  $\mathbf{S}$  of the positons as we intended at the beginning. In positons, the field  $B^*$  always penetrates through the base of vector  $\mathbf{S}$ , thus being the proton completely stabilised.

Now we can calculate the value of angle  $\theta$ , which fulfils the relationship:

$$\tan(\theta) = \frac{B'_{py}}{B_x} = \frac{\frac{A}{4r^2} \text{Cos}(\theta)}{\frac{A}{r^2} + \frac{A}{4r^2} \text{Sen}(\theta)} = \frac{\text{Cos}(\theta)}{4 + \text{Sen}(\theta)} \quad (36)$$

Solving this equation we will obtain that:

$$\text{Sen}(\theta) = -1 + \frac{\sqrt{6}}{2}, \quad \text{then} \quad \theta = 12,9878...^\circ \quad (37)$$

### 3.4 - Total magnetic and angular momenta

From figure 6 for the proton, we obtain the following equation for angular momenta:

$$\vec{J} = 2\vec{L} + \vec{S} + 2\vec{S} \cdot \text{Sen}(\theta) \quad (38)$$

Considering that the total angular momentum  $\vec{J}$  of the proton is equal to that of the tons and that its value is

$$|\vec{J}| = |\vec{S}| = \alpha \cdot \hbar \quad (39)$$

we obtain from (38) that the orbital angular momentum of the positons is

$$L = -S \cdot \text{Sen}(\theta) \quad (40)$$

and, taking into account (27) and (39), the numerical value of  $n$  is

$$n = -\alpha \cdot \text{Sen}(\theta) \quad (41)$$

Let us note that the values of  $L$  and  $n$  are negative, which implies that positons spin in their orbit the other way round, as it is indicated with the speed  $v$  in Figure 6.

We obtain the following equation for the magnetic momenta:

$$\vec{\mu} = \vec{\mu}_{SB} + 2 \cdot \vec{\mu}_{SA} \cdot \text{Sen}(\theta) + 2 \cdot \vec{\mu}_{LA} \quad (42)$$

where  $\vec{\mu}$  is the total magnetic momentum of the proton. Let us develop these terms:

- According to (9), the value of the spin magnetic momentum of the negaton is

$$\mu_{SB} = |\vec{\mu}_{SB}| = \frac{g_{AB}}{2} \cdot \frac{e \cdot S}{m_B} \quad (43)$$

- The positons have a spin magnetic momentum of value

$$\mu_{SA} = |\vec{\mu}_{SA}| = \frac{g_{AB}}{2} \cdot \frac{e \cdot S}{m_A} \quad (44)$$

- And the value of the magnetic momentum produced by the positons in the loop according to (3) is

$$\mu_{LA} = |\vec{\mu}_{LA}| = \left| \frac{e \cdot \vec{L}}{2 \cdot m_A} \cdot (\hat{s} \cdot \hat{v}) \right| = \frac{e \cdot L}{2 \cdot m_A} \cdot \text{Cos}(180^\circ - \theta) = -\frac{e \cdot L}{2 \cdot m_A} \cdot \text{Cos}(\theta) \quad (45)$$

Let us note that this value is positive, as the orbital angular momentum  $L$  has a negative value.

Consequently, the value of the total magnetic momentum of the proton, according to the equation (42) is

$$\mu = |\vec{\mu}| = \frac{g_{AB}}{2} \cdot \frac{e \cdot S}{m_B} + g_{AB} \cdot \frac{e \cdot S}{m_A} \cdot \text{Sen}(\theta) - \frac{e \cdot L}{m_A} \cdot \text{Cos}(\theta) \quad (46)$$

and according to (39) and (40) we can also express this momentum depending on  $J$  as follows

$$\begin{aligned} \mu &= \frac{g_{AB}}{2} \cdot \frac{e \cdot S}{m_B} + g_{AB} \cdot \frac{e \cdot S}{m_A} \cdot \text{Sen}(\theta) + \frac{e \cdot S \cdot \text{Sen}(\theta)}{m_A} \cdot \text{Cos}(\theta) = \\ &= \left[ g_{AB} \cdot \frac{m_A + 2 \cdot m_A \cdot \text{Sen}(\theta)}{2 \cdot m_A \cdot m_B} + \frac{\text{Sen}(\theta) \cdot \text{Cos}(\theta)}{m_A} \right] \cdot e \cdot S = \gamma \cdot J \end{aligned} \quad (47)$$

$$\text{being } \gamma = \left[ g_{AB} \cdot \frac{m_A + 2 \cdot m_A \cdot \text{Sen}(\theta)}{2 \cdot m_A \cdot m_B} + \frac{\text{Sen}(\theta) \cdot \text{Cos}(\theta)}{m_A} \right] \cdot e = \frac{\mu}{J} \quad (48)$$

### 3.5 - Larmor precession frequency

If we submit this proton to an external magnetic field  $\vec{B}$ , its magnetic moment  $\vec{\mu}$  precesses around field  $\vec{B}$  analogously to the precession of a spinning top around the gravity field.

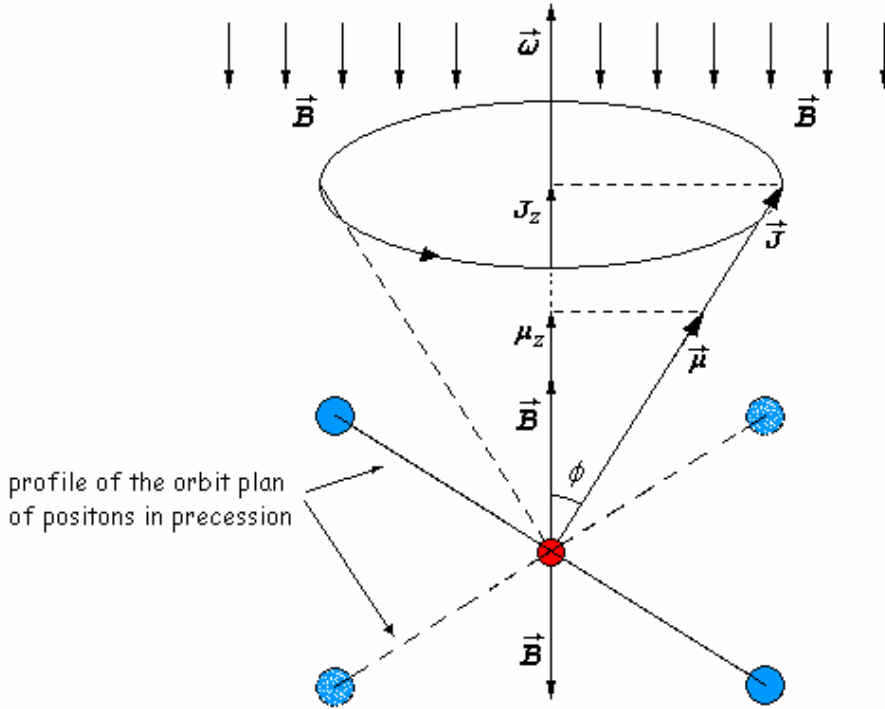


Figure 7. - Precession of the proton's orbit

According to figure 7, the proton's orbit undergoes a moment  $\vec{N}$  that tends to align the magnetic moment  $\vec{\mu}$  with magnetic field  $\vec{B}$ , this moment is:

$$\vec{N} = \vec{\mu} \wedge \vec{B} = \gamma \cdot \vec{J} \wedge \vec{B} \quad (49)$$

which makes  $\vec{\mu}$  and  $\vec{J}$  precess around the direction of  $\vec{B}$ , with an angular velocity  $\vec{\omega}$  that we can calculate from the angular momentum theorem:  $\vec{N} = \frac{d}{dt} \vec{J}$ . Indeed, as vector  $\vec{J}$  has its origin fixed in the centre of the orbit (in the negaton),  $\frac{d}{dt} \vec{J}$  is the velocity at the end of  $\vec{J}$ , that is:  $\frac{d}{dt} \vec{J} = \vec{\omega} \wedge \vec{J}$ , which together with (49) leads to:

$$\vec{\omega} \wedge \vec{J} = \gamma \cdot \vec{J} \wedge \vec{B} \quad \Rightarrow \quad (\vec{\omega} + \gamma \cdot \vec{B}) \wedge \vec{J} = 0 \quad (50)$$

and, as vector  $\vec{J} \neq 0$ , we finally have the Larmor precession angular frequency:

$$\vec{\omega} = -\gamma \cdot \vec{B} \quad (51)$$

which makes the orbital plane change as shown on figure 7.

In the figure we see that  $\vec{\omega}$  and  $\vec{B}$  take opposite directions, therefore the value of the Larmor precession angular frequency will be

$$\omega = \gamma \cdot B \quad (52)$$

In addition, the following equalities are fulfilled:

$$J_z = J \cdot \text{Cos}[\phi] \quad (53)$$

$$\mu_z = \mu \cdot \text{Cos}[\phi] \quad (54)$$

then, by dividing both of them, we obtain:

$$\frac{J_z}{\mu_z} = \frac{J}{\mu} \quad (55)$$

Finally, from (47) and (55) we obtain

$$\omega = \gamma \cdot B = \frac{\mu}{J} \cdot B = \frac{\mu_z}{J_z} \cdot B \quad (56)$$

and from (53) and (54) we can obtain the precession angle  $\phi$

$$\phi = \text{ArcCos} \left[ \frac{J_z}{J} \right] = \text{ArcCos} \left[ \frac{\mu_z}{\mu} \right] \quad (57)$$

On the other hand, the experiments on magnetic resonance imaging tell us that the Larmor precession angular frequency of the proton is

$$\omega = \frac{2 \cdot \mu_p}{\hbar} \cdot B = \frac{2 \cdot \mu_o \cdot \mu_N}{\hbar} \cdot B = \frac{\mu_o \cdot e}{m_p} \cdot B \quad (58)$$

where  $\mu_p = \mu_o \cdot \mu_N$  is the magnetic momentum of the proton and  $\mu_N = \frac{e \cdot \hbar}{2 \cdot m_p}$ , the nuclear magneton. Once  $\omega$  is known, from (58) we obtain the value of the  $\mu_o$  coefficient, which is

$$\mu_o = \frac{\omega \cdot m_p}{e \cdot B} = 2.792847356 \dots \quad (59)$$

and from here, we can obtain the value of the magnetic momentum of the proton  $\mu_p = \mu_o \cdot \mu_N$ .

Equalling both Larmor frequencies (52) and (58), and taking into account the value obtained from  $\gamma$  in (48), we have that

$$\left[ g_{AB} \cdot \frac{m_A + 2 \cdot m_A \cdot \text{Sen}(\theta)}{2 \cdot m_A \cdot m_B} + \frac{\text{Sen}(\theta) \cdot \text{Cos}(\theta)}{m_A} \right] \cdot e \cdot B = \frac{\mu_o}{m_p} \cdot e \cdot B \quad (60)$$

$$\text{then} \quad g_{AB} \cdot \frac{m_A + 2 \cdot m_A \cdot \text{Sen}(\theta)}{2 \cdot m_A \cdot m_B} + \frac{\text{Sen}(\theta) \cdot \text{Cos}(\theta)}{m_A} = \frac{\mu_o}{m_p} \quad (61)$$

and clearing  $g_{AB}$  we obtain

$$g_{AB} = \frac{2 \cdot m_B \cdot (\mu_o \cdot m_A - m_p \cdot \text{Sen}(\theta) \cdot \text{Cos}(\theta))}{m_p \cdot (m_A + 2 \cdot m_B \cdot \text{Sen}(\theta))} = 1,009640492374899 \dots \quad (62)$$

If we take a closer look, this value obtained for  $g_{AB}$  that links the relationship existing between active mass and passive mass according to (11), only depends on the masses of the tons, on the orientation of the angular momenta of spin  $\mathbf{S}$  of the positons ( $\theta$  angle) and on the  $\mu_o$  coefficient, and does not depend at all on the numerical value  $\alpha$ , which is still unknown to us, to be able to calculate the values of momenta  $S$ ,  $J$  and  $L$ .

From (56) and (58) we obtain the following relationship

$$\omega = \gamma \cdot B = \frac{\mu}{J} \cdot B = \frac{\mu_z}{J_z} \cdot B = \frac{2 \cdot \mu_p}{\hbar} \cdot B = \frac{\mu_p}{\hbar/2} \cdot B \quad (63)$$

and we can ask ourselves if the calculated magnetic momentum  $\mu_p$  of the proton is really the momentum  $\mu$  or only its component  $\mu_z$ . The interpretation of Aspin Bubbles is the second option, that is,  $\mu_z = \mu_p$ , and consequently  $J_z = \hbar/2$ . We will show this below in the resolution.

Usually, the Larmor precession frequency is measured in Hz and is named by  $\omega_p$ , and therefore it can be expressed as:

$$\omega_p = \frac{\omega}{2 \cdot \pi} = \frac{\mu_z}{\pi \cdot \hbar} \cdot B = \frac{\mu_p}{\pi \cdot \hbar} \cdot B \quad (64)$$

### 3.6 - Resolution

We know that the proton is very stable, meaning that there must be a very strong union between tons. To this end, we have numerically searched a value for  $\alpha$  so that its orbital radius is minimum. We will name it " $\alpha$  limit", and we will see the reason why below. This is achieved when the quotient

$$\frac{r}{R_{MA} + R_{MB}} \cong 1 \quad (65)$$

that is, when the sizes of the positon and negaton are maximum, and they fit at least in the orbital diameter. It is to be taken into consideration that this fact occurs every certain time as the pulsation frequencies of the tons are different.

The process is as follows: A value is given to  $\alpha$ , which implies a direct value of  $n$  in accordance with (41) and the equation (28) is numerically solved, which provides the value of the unknown  $x$ . With this data, the rest is then calculated. The results are the following:

$$\alpha = 0,51714564051\dots \quad \text{"}\alpha \text{ limit"}$$

$$n = -0,1162258304671\dots$$

$$x = 3,0030120231661\dots$$

$$r = x \cdot R_{A1} = 1,79393481341941\dots \cdot 10^{-15} \text{ m as } x = r/R_{A1}$$

which implies that the relationship (65) takes a value very close to one:

$$\frac{r}{R_{MA} + R_{MB}} = 1,000000000001123\dots \quad (66)$$

It is not necessary to calculate any more decimals. Thus, using (25) the binding force is:

$$F_{BINDING} = F_A = 80,62923351823\dots \text{ N} \quad (67)$$

From (63) and (39), if  $\mu = \mu_p$  we would have:

$$\omega = \gamma \cdot B = \frac{\mu}{J} \cdot B = \frac{2 \cdot \mu_p}{\hbar} \cdot B = \frac{\mu_p}{\hbar/2} \cdot B \Rightarrow J = \hbar/2 = \alpha \cdot \hbar \Rightarrow \alpha = 1/2$$

This value of  $\alpha$  is not possible because  $\frac{r}{R_{MA} + R_{MB}} < 1$  and therefore, the positons would not be able to orbit around the negaton. In addition, from (63), we would have that  $J = J_z$  and due to (57),  $\phi = 0$ . Consequently, we would not have any precession.

Quantum mechanics indicate that the magnitude of a spin angular momentum  $\vec{S}$  with quantum number  $s=1/2$  is  $S = \sqrt{s \cdot (s+1)} \cdot \hbar = \sqrt{3} \cdot \hbar/2$ . And, according to (39),  $J = S = \alpha \cdot \hbar$ , therefore the value of  $\alpha$  should be  $\alpha = \sqrt{3}/2$

The sizes of the tons do not change with  $\alpha$ , they do not depend on its value. Any value included between "alpha limit" and the one proposed by quantum mechanics could be correct. The most important differences are shown on the following Table I.

	"alpha limit"	$\alpha = \sqrt{3}/2$
$\alpha$	0,51714564051....	0,8660254037.....
$n = -\alpha \cdot \text{Sen}(\theta)$	-0,1162258304671.....	-0,1946347679953....
$x = r/R_{AI}$	3,0030120231661....	9,6103866927699....
radius $r$ orbit in m	1,79393481341941.... $\cdot 10^{-15}$	5,7410383726687.... $\cdot 10^{-15}$
$\frac{r}{R_{MA} + R_{MB}}$	1,000000000001123.....	3,2002491560617....
$\frac{\mu}{\mu_N} = 2 \cdot \mu_o \cdot \alpha$	2,88861766953....	4,8373535183....
$J_z / \hbar$	1/2	1/2
$\frac{J}{J_z} = \frac{\mu}{\mu_z} = 2 \cdot \alpha$	1,03429128102	$\sqrt{3} = 1,7320508075....$
$\omega_p$ in MHz with $B = 1$ T	42,57748059....	42,57748059....
angle $\phi$	14,795011...°	54,735610...°
Binding force in N	80,62923351823.....	7,076346884....

TABLE I .- Comparisons of  $\alpha$  values in the proton

As expected, both values obtained for  $J_z / \hbar$  and  $\omega_p$  are the same and they do not depend on the value given to  $\alpha$ . All the other values are different. It is difficult to make an analysis of the table without including the size of the tons. For the " $\alpha$  limit" value, we provide below the essential characteristics and dimensions of the proton, changing for different energetic statuses according to the excitement factor  $\tau$  that tons can have (see 12). The values  $\alpha$ ,  $n$ ,  $\mu$ ,  $\mu_z$ ,  $J$ ,  $J_z$ ,  $\omega_p$  and  $\phi$  are constant regardless of the value of factor  $\tau$ .

factor $\tau$	1	$10^3$	$10^6$	$10^9$
Energy in MeV	$9,382720 \cdot 10^2$	$9,382720 \cdot 10^5$	$9,382720 \cdot 10^8$	$9,382720 \cdot 10^{11}$
Positon diameter	in meters			
maximum $2 \cdot R_{MA}$	$2,39411 \cdot 10^{-15}$	$7,55676 \cdot 10^{-17}$	$2,38951 \cdot 10^{-18}$	$7,55630 \cdot 10^{-20}$
balance $2 \cdot R_{AI}$	$1,19475 \cdot 10^{-15}$	$3,77815 \cdot 10^{-17}$	$1,19475 \cdot 10^{-18}$	$3,77815 \cdot 10^{-20}$
minimum $2 \cdot R_{mA}$	$2,50091 \cdot 10^{-20}$	$7,46297 \cdot 10^{-25}$	$2,35252 \cdot 10^{-29}$	$7,43835 \cdot 10^{-34}$
Negaton diameter	in meters			
maximum $2 \cdot R_{MB}$	$1,19375 \cdot 10^{-15}$	$3,78204 \cdot 10^{-17}$	$1,19605 \cdot 10^{-18}$	$3,78227 \cdot 10^{-20}$
balance $2 \cdot R_{BI}$	$5,98029 \cdot 10^{-16}$	$1,89113 \cdot 10^{-17}$	$5,98029 \cdot 10^{-19}$	$1,89113 \cdot 10^{-20}$
minimum $2 \cdot R_{mB}$	$1,10645 \cdot 10^{-20}$	$3,71081 \cdot 10^{-25}$	$1,17719 \cdot 10^{-29}$	$3,72305 \cdot 10^{-34}$
Changing	characteristics			
$x = r/R_{AI}$	3,003012.....	109,841219...	3473,84387...	109852,000...
Diameter orbit $2 \cdot r$	$3,58786 \cdot 10^{-15}$	$4,14996 \cdot 10^{-15}$	$4,15039 \cdot 10^{-15}$	$4,15039 \cdot 10^{-15}$
Diameter $2(r + R_{MA})$	$5,98198 \cdot 10^{-15}$	$4,22553 \cdot 10^{-15}$	$4,15278 \cdot 10^{-15}$	$4,15047 \cdot 10^{-15}$
(a) $\frac{r}{R_{MA} + R_{MB}}$	1,0000000....	36,599701...	1157,52671...	36604,2351...
(b) $\frac{r}{R_{AI} + R_{BI}}$	2,001280...	73,200887...	2315,05491...	73208,4718...
(c) $\frac{r}{R_{mA} + R_{mB}}$	$9,94594 \cdot 10^4$	$3,71402 \cdot 10^9$	$1,17584 \cdot 10^{14}$	$3,7185 \cdot 10^{18}$
Binding force in N	80,629233...	53,588091...	53,572563...	53,572547...

TABLE II .- Results of the proton for " $\alpha$  limit"



Analysing Table II, we observe that the sizes of the tons for  $\tau = 1$  are completely compatible with the latest measurements obtained for the proton (diameter =  $1,6836... \cdot 10^{-15}$  m). Possibly we are measuring the real size of the tons, because as factor  $\tau$  increases we have the following:

- 1.- The size of the tons decreases, specially their minimum diameters decrease drastically,  $2 \cdot R_{mA} = 7,43835 \cdot 10^{-34}$  m and  $2 \cdot R_{mB} = 3,72305 \cdot 10^{-34}$  m for a proton energy of  $9,382720 \cdot 10^{11}$  MeV.
- 2.- The orbital diameter increases slightly and tends to stabilize at  $4,15039... \cdot 10^{-15}$  m
- 3.- As a result of 1 and 2, the tons leave much empty space between each other, see relationships a, b and c. Consequently, it can be said that the proton is empty inside.
- 4.- The binding force decreases slightly and becomes stable at  $53,572547... \text{ N}$

For the value  $\alpha = \sqrt{3}/2$ , given by quantum mechanics, the orbital diameter ( $2 \cdot r = 1,148207... \cdot 10^{-14}$  m) is too big and the binding force ( $7,076346... \text{ N}$ ) is very weak. The positon as a mechanical machine may possibly need a small tolerance in its dimensions to be able to operate, achieving this with a value  $\alpha$  close to " $\alpha$  limit", compatible with a slight modification of quantum mechanics parameters. To this end, it would suffice to say that the magnitude of the spin angular momentum  $\vec{S}$  for a quantum number  $s = 1/2$  is:

$$S = \frac{3}{5} \cdot \sqrt{s \cdot (s+1)} \cdot \hbar = \frac{3}{5} \cdot \frac{\sqrt{3}}{2} \cdot \hbar = \frac{3 \cdot \sqrt{3}}{10} \cdot \hbar = \alpha \cdot \hbar \quad (68)$$

$$\Rightarrow \alpha = \frac{3 \cdot \sqrt{3}}{10} = 0,519615... \text{ and } \frac{\alpha}{\alpha \text{ lim.}} = 1,004775... \quad (69)$$

For this value  $\alpha$  and  $\tau = 1$  we obtain the following:

$$n = -0,116780... \quad (70)$$

$$x = 3,044279... \quad (71)$$

$$2 \cdot r = 2 \cdot x \cdot R_{AI} = 3,637173... \cdot 10^{-15} \text{ m} \quad (72)$$

$$\frac{r}{R_{MA} + R_{MB}} = 1,013741... \quad (73)$$

$$\phi = 15,793169...^\circ \quad (74)$$

$$F_{BINDING} = F_A = 78,195478... \text{ N} \quad (75)$$

For high values of  $\tau$ , the orbital diameter becomes stable at  $4,190134 \cdot 10^{-15}$  m and the binding force at  $52,561317 \text{ N}$ . As we can see, these are not remarkable changes; nevertheless we provide continuity to quantum mechanics.

#### 4. - The antiproton

To be able to build the antiproton it is enough to exchange the tons and reverse their angular momenta.

When we speak of exchanging the tons it means that two negatons with a mass  $m_B$  are going to be orbiting around a positon with a mass  $m_A$ , and as we have done in the case of the proton, we have to calculate the value of these masses.

In the decay of the antineutron in antiproton plus positron plus neutrino,

$$\bar{n} = \bar{p} + e^+ + \nu_e \quad (76)$$

we consider that the antineutron and the neutrino, as they are neutral particles, have the same amount of both positonic and negatonic mass. Applying the mass conservation law we shall obtain:

$$\text{for the negatonic mass } B \quad \rightarrow \quad \frac{m_{an}}{2} = 2 \cdot m_B + \frac{m_\nu}{2} \quad (77)$$

$$\text{and for the positonic mass } A \quad \rightarrow \quad \frac{m_{an}}{2} = m_A + m_{e^+} + \frac{m_\nu}{2} \quad (78)$$

$$\text{subtracting both equations} \quad \Rightarrow \quad 0 = 2 \cdot m_B - m_A - m_{e^+} \quad (79)$$

and taking into account the structure defined for the antiproton, its mass is:

$$m_{ap} = 2 \cdot m_B + m_A \quad (80)$$

thus, resolving the system of equations (79) and (80) we finally obtain that:

$$\text{the mass of the negatons is} \quad \rightarrow \quad m_B = \frac{m_{ap} + m_{e^+}}{4} = \frac{m_p + m_e}{4} \quad (81)$$

$$\text{and the mass of the positon is} \quad \rightarrow \quad m_A = \frac{m_{ap} - m_{e^+}}{2} = \frac{m_p - m_e}{2} \quad (82)$$

taking into account that the masses of the particle and the antiparticle are the same.

Note that, in addition, the mass of the positon is almost double the mass of the negatons

$$\frac{m_A}{m_B} = 2 \cdot \frac{m_p - m_e}{m_p + m_e} \cong 2 \quad (83)$$

If we compare these results with those for the proton (22, 23 and 24) we can see that they are identical except for the fact that the masses are also exchanged.

Conclusion: To be able to build an antiparticle we have to exchange positons for negatons, negatons for positons, and also exchange the value or their masses

Let us see now in more detail the reversal of the angular momenta or, in other words, let us rotate 180° all the particle momenta.

Let us first consider the case of the electron and the positron in the following figure:

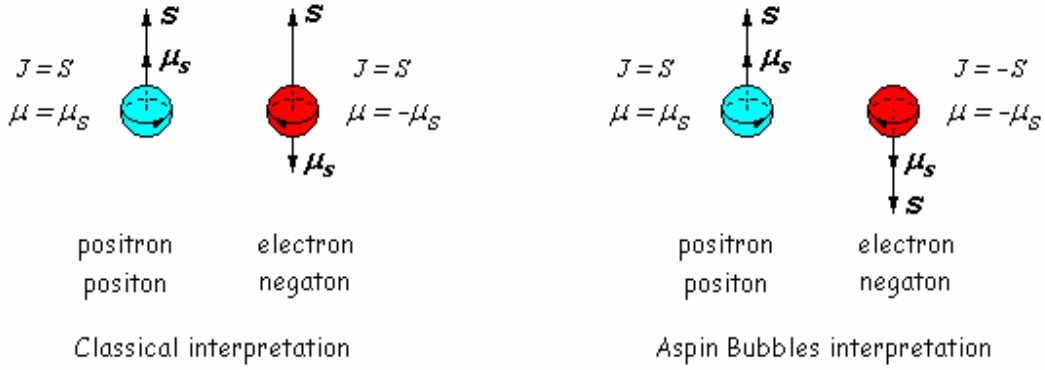


Figure 8. - Momenta of positron and electron

In Aspin Bubbles there are no electrical charges or distant forces; everything is mechanics, and according to (1), (2) and (3), the angular and magnetic momenta of the positron are positive and those of the electron (antiparticle) are negative, as it is shown in Figure 8. This can be generalized as follows: If a particle has an angular momentum  $J$ , its antiparticle will always have a momentum  $-J$ . And for the magnetic momenta we will have the same situation: If a particle has a magnetic momentum  $\mu$ , its antiparticle will have a momentum  $-\mu$ .

Taking this into account, the angular momentum of the antiproton will be  $J = -S$  and its total magnetic momentum will also be negative.

Therefore, the equation for angular momenta will be

$$J = -S = 2L_B - S_A - 2S_B \cdot \text{Sen}(\theta) \quad (84)$$

and as  $S = S_A = S_B = \alpha \cdot \hbar$ , we will have

$$L_B = S_B \cdot \text{Sen}(\theta) = S \cdot \text{Sen}(\theta) \text{ and } n = \alpha \cdot \text{Sen}(\theta) \quad (85)$$

therefore, the orbital angular momentum is positive and the negatons spin clockwise, as opposed to the proton.

For the magnetic momenta we will obtain the following equation:

$$\mu = -\mu_{SA} - 2 \cdot \mu_{SB} \cdot \text{Sen}(\theta) + 2 \cdot \mu_{LB} \quad (86)$$

but the value of the magnetic momentum produced by negatons in the loop according to (3) is

$$\mu_{LB} = \frac{e \cdot L_B}{2 \cdot m_B} \cdot (\hat{s} \cdot \hat{v}) = \frac{e \cdot L_B}{2 \cdot m_B} \cdot \text{Cos}(180^\circ - \theta) = -\frac{e \cdot L_B}{2 \cdot m_B} \cdot \text{Cos}(\theta) \quad (87)$$

therefore, the total magnetic momentum of the antiproton will be

$$\mu = -\frac{g_{AB}}{2} \cdot \frac{e \cdot S}{m_A} - g_{AB} \cdot \frac{e \cdot S}{m_B} \cdot \text{Sen}(\theta) - \frac{e \cdot L_B}{m_B} \cdot \text{Cos}(\theta) \quad (88)$$

which is the same value as that of the proton but a negative one.

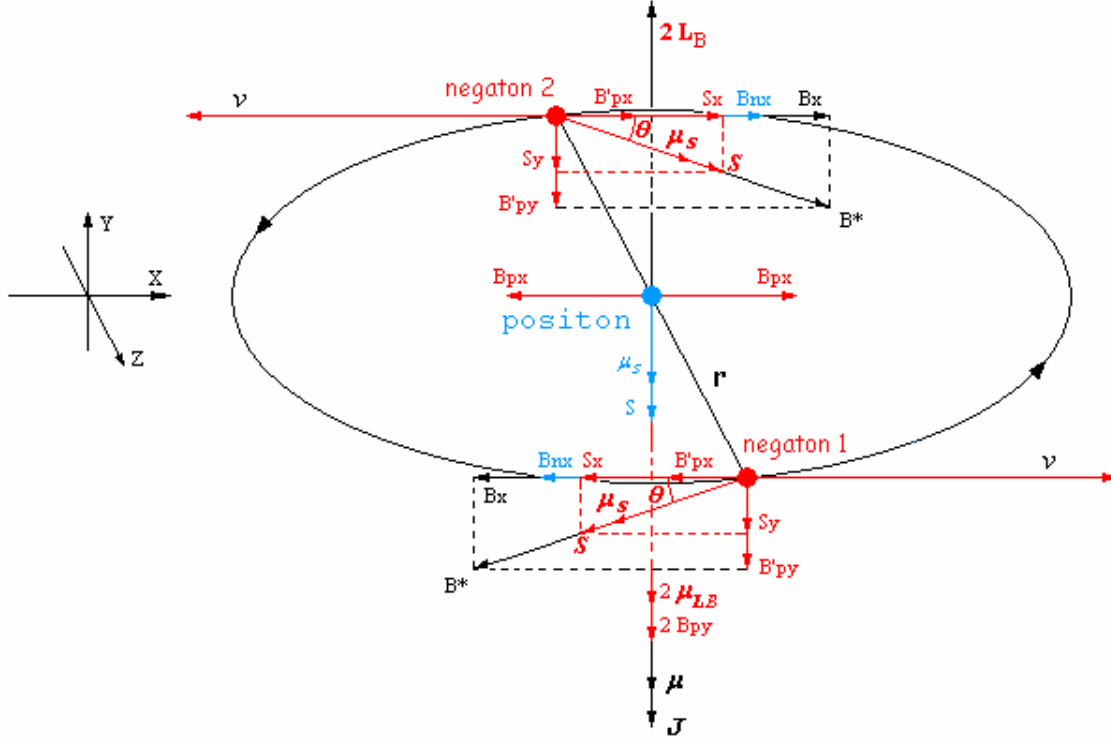


Figure 9. - Aligement of fields B with spin angular momenta S in the Antiproton

The  $B^*$  fields also penetrate by the base of the  $S$  vectors of the negatons and form the same angle  $\theta$  with the trajectory of the orbit and an angle  $180^\circ - \theta$  with the speed vector  $v$ . This is the reason why magnetic momenta  $\mu_{LB}$  are negative, as obtained in (87).

As with the proton, the  $\mu_z$  component will be negative and its value will be  $\mu_z = \mu_{ap} = -\mu_o \cdot \mu_N = -\mu_p$ . As  $J$  is negative, its component  $J_z$  will also be negative, its value being  $J_z = -\hbar/2$ . Therefore, the precession angle  $\phi$  according to (57) will be the same and the Larmor precession angular frequency will also be that of the proton.

It can be verified that the gyromagnetic coefficient has the same value (62) and can be expressed as

$$g_{AB} = \frac{2 \cdot m_A \cdot (\mu_o \cdot m_B - m_{ap} \cdot \text{Sen}(\theta) \cdot \text{Cos}(\theta))}{m_{ap} \cdot (m_B + 2 \cdot m_A \cdot \text{Sen}(\theta))} = 1,009640492374899.... \quad (88^*)$$

As for the existing binding forces, we will have:

- The attraction force that positon  $A$  exerts over negatons  $B$

$$F_A = F_{AB} = \delta_A \cdot \delta_B \cdot \frac{\text{Aspin}_A}{\text{Aspin}_B} \cdot \frac{k \cdot e^2}{r^2 - R_{B1}^2} = -\frac{\text{Aspin}_A}{\text{Aspin}_B} \cdot \frac{k \cdot e^2}{(x^2 - 1) \cdot R_{B1}^2} \quad (89)$$

where we change the variable  $x = r/R_{B1}$

- The repulsion force that negatons  $B$  exert among each other

$$F_R = F_{BB} = \delta_B \cdot \delta_B \cdot \frac{\text{Aspin}_B}{\text{Aspin}_B} \cdot \frac{k \cdot e^2}{(2r)^2 - R_{B1}^2} = \frac{k \cdot e^2}{(4x^2 - 1) \cdot R_{B1}^2} \quad (90)$$

- And the centrifugal force due to the orbital movement of the negatons

$$F_C = \frac{L_B^2}{m_B \cdot r^3} = \frac{n^2 \cdot \hbar^2}{m_B \cdot r^3} \quad (91)$$

Finally, simplifying  $-F_A = F_R + F_C$ , we obtain the equation (92)

$$\frac{Aspin_A}{Aspin_B} \cdot x^3 \cdot (4x^2 - 1) - x^3 \cdot (x^2 - 1) - \alpha_0 \cdot (x^2 - 1) \cdot (4x^2 - 1) = 0 \text{ with } \alpha_0 = \frac{n^2 \cdot \hbar^2}{m_B \cdot R_{B1} \cdot k \cdot e^2}$$

factor $\tau$	1	$10^3$	$10^6$	$10^9$
Energy in MeV	$9,382720 \cdot 10^2$	$9,382720 \cdot 10^5$	$9,382720 \cdot 10^8$	$9,382720 \cdot 10^{11}$
Positon diameter	in meters			
maximum $2 \cdot R_{MA}$	$1,19836 \cdot 10^{-15}$	$3,78250 \cdot 10^{-17}$	$1,19606 \cdot 10^{-18}$	$3,78227 \cdot 10^{-20}$
balance $2 \cdot R_{AI}$	$5,98029 \cdot 10^{-16}$	$1,89113 \cdot 10^{-17}$	$5,98029 \cdot 10^{-19}$	$1,89113 \cdot 10^{-20}$
minimum $2 \cdot R_{mA}$	$1,25182 \cdot 10^{-20}$	$3,73555 \cdot 10^{-25}$	$1,17754 \cdot 10^{-29}$	$3,72327 \cdot 10^{-34}$
Negaton diameter	in meters			
maximum $2 \cdot R_{MB}$	$2,38491 \cdot 10^{-15}$	$7,55584 \cdot 10^{-17}$	$2,38950 \cdot 10^{-18}$	$7,55630 \cdot 10^{-20}$
balance $2 \cdot R_{BI}$	$1,19475 \cdot 10^{-15}$	$3,77815 \cdot 10^{-17}$	$1,19475 \cdot 10^{-18}$	$3,77815 \cdot 10^{-20}$
minimum $2 \cdot R_{mB}$	$2,21049 \cdot 10^{-20}$	$7,41355 \cdot 10^{-25}$	$2,35182 \cdot 10^{-29}$	$7,43809 \cdot 10^{-34}$
Changing	characteristics			
$x = r/R_{B1}$	3,003012.....	109,841219...	3473,84387...	109852,600...
Diameter orbit $2 \cdot r$	$3,58786 \cdot 10^{-15}$	$4,14996 \cdot 10^{-15}$	$4,15039 \cdot 10^{-15}$	$4,15039 \cdot 10^{-15}$
Diameter $2(r + R_{MB})$	$5,97278 \cdot 10^{-15}$	$4,22552 \cdot 10^{-15}$	$4,15278 \cdot 10^{-15}$	$4,15047 \cdot 10^{-15}$
(a) $\frac{r}{R_{MA} + R_{MB}}$	1,0012825....	36,601185...	1157,52819...	36604,2366...
(b) $\frac{r}{R_{AI} + R_{BI}}$	2,001280...	73,200887...	2315,05491...	73208,4718...
(c) $\frac{r}{R_{mA} + R_{mB}}$	$1,03626 \dots \cdot 10^5$	$3,72224 \dots \cdot 10^9$	$1,17596 \dots \cdot 10^{14}$	$3,7185 \dots \cdot 10^{18}$
Binding force in N	80,629233...	53,588091...	53,572563...	53,572547...

TABLE III .- Results of the antiproton for " $\alpha$  limit"

Comparing Tables II and III for the " $\alpha$  limit" value it can be seen that the sizes of the orbital positons of the proton are practically the same as the orbital negatons of the antiproton, and the size of the central negaton of the proton is also comparable to that of the central positon of the antiproton. All the other findings are very similar. Also in the antiproton, for high  $\tau$  values, the orbital diameter becomes stable at  $4,15039... \cdot 10^{-15}$  m and the binding force at  $53,572547... \text{ N}$ . Proton and antiproton are practically equal. There is only one important finding in the antiproton, which is the following:

$$\frac{r}{R_{MA} + R_{MB}} = 1,0012825... \quad (93)$$

which means that negatons have a little more room to orbit around the central positon. We must not forget that for the proton this value was  $1,000000000001123.....$ , which is the reason why we think again in the "quantum"  $\alpha$  that we proposed for the proton.

For this value  $\alpha = \frac{3 \cdot \sqrt{3}}{10} = 0,519615...$  and  $\tau = 1$  we obtain the following:

$$n = -0,116780... \quad (94)$$

$$x = 3,044279... \quad (95)$$

$$2 \cdot r = 2 \cdot x \cdot R_{AI} = 3,637173... \cdot 10^{-15} \text{ m} \quad (96)$$

$$\frac{r}{R_{MA} + R_{MB}} = 1,015042... \quad (97)$$

$$\phi = 15,793169...^\circ \quad (98)$$

$$F_{BINDING} = F_A = 78,195478... \text{ N} \quad (99)$$

where all the values are practically the same as those for the proton except for (97), which differs very little from (73). In addition, for high values of  $\tau$ , the orbital diameter of this antiproton also becomes stable at  $4,190134 \cdot 10^{-15}$  m and its binding force at  $52,561317 \text{ N}$ . As we can see, these are not remarkable changes; nevertheless we would give room to the orbiting tons and, in doing so, we would also provide continuity to quantum mechanics.

## 5. - Conclusions and predictions

We believe that we have found the structures of both the proton and the antiproton that meet the knowledge we have of them up until today. And they are simply structures formed by two tons in a circular orbit around the opposite ton.

Indeed, seen without prejudices, the proton is a simple mechanical machine very difficult to destroy. It is very stable, and as we excite it (increasing its energy) it is even more difficult to destroy, because although its binding force decreases slightly, the size of its tons decreases considerably and therefore, the space between them increases largely. This implies for a projectile to pass through it easily without disturbing it. We believe that it would be easier to destroy a proton when it is not excited and recompose it to obtain other particles from it. We are considering fusion. To achieve cold fusion we have to deceive the proton. In subsequent articles we will go deeper into this possibility. The same can be said for the antiproton.

The neutron's structure is already solved by this approach and will be published shortly. The importance of this particle will help us prove that protons are basic in the construction of matter. As we progress in Aspin Bubbles<sup>[1]</sup>, all particles, nuclei and atoms are formed by bound tons. It is our planetary system in small.

We will see that the neutron provides the key to understanding what the dark matter actually is and the reason why it is an unstable particle. In this article we will also see the construction of the photon.

We will gradually construct and publish the world of Aspin Bubbles that suits reality. Relativity, as we have already mentioned, is also completed and we will publish it soon, after the neutron. Below we will construct the rest of matter (neutrino, alpha particle, nuclei and atoms) step by step as well as permitted antimatter.

We say "permitted antimatter" because with Aspin Bubbles it is not possible to construct anti-molecules. Therefore, antimatter worlds do not exist.

Antigravity can not exist either. The force between neutral matters, between these and antiatoms or between antiatoms is always the force of gravity.

Dark energy exists and it is a consequence of the weak force existing between the neutral matter and the non-neutral matter (more positons than negatons or the opposite), a force not yet discovered. Its value should be between the force of gravity and the electrical force (in the order of  $10^{19}$  times the force of gravity or  $10^{19}$  times less than the electrical force). In Aspin Bubbles<sup>[1]</sup> we said the following:

1.- *Neutral matter repels positive matter (positrons, positive ions, etc.) and positive matter, in turn, attracts neutral matter.*

This perfectly explains the accelerated expansion of our universe and dark energy. We will find the latter in the confines of our universe as positive matter. It is also the cause for the Brownian motion of atmospheric particles; the positive ions are slightly repelled from the Earth's surface.

2.- *Neutral matter attracts negative matter (electrons, negative ions, etc.) and negative matter, in turn, repels neutral matter.*

This is why neutrinos can cleanly cross matter. The cortical electrons of the atoms repel the neutrinos, formed by a positon and a negaton (neutral matter). It also helps the electrons to always be on the surface of materials and conductors.

Aspin Bubbles is not a model, it is not a theory, and it is not a coincidence or a manipulation to obtain certain results. It has a mathematical backup in all what it achieves, its mechanical engineering is initially simple: Only two substances, A and B, forming the ether that fills the space. Two substances transforming into tons with the help of energy: positon A and negaton B, and these (pulsatory bubbles) with the anharmonic vibration of their membranes produce anharmonic spherical waves supported by the ether, and one single mechanical interaction between the waves and the tons. Tons self-propel themselves in this field of waves. There is nothing more, everything we know is then constructed as from here. Let's recall some other important results not mentioned before:

- 1.- It unifies all known forces. It really obtains them with mathematical support and gives mechanical sense to all of them: Electrical, magnetic, gravity, Casimir, nuclear forces, etc.
- 2.- It gives sense to the project *La transformada de "Aspin Bubbles"*, ensayo de un complemento a la transformada de Galileo<sup>[4]</sup>.
- 3.- Permitted antimatter is constructed interchanging positons for negatons and vice versa.
- 4.- It obtains the precession of the planets' perihelion (it will be published with the Relativity paper).
- 5.- It corroborates results from Quantum Mechanics and it agrees with the principle of uncertainty. Tons are very difficult to locate due to the pulsation of their membrane, which constantly changes its size. See examples on the last tables (negaton sizes  $2 \cdot R_{MB} = 1,19605 \cdot 10^{-18}$  m and  $2 \cdot R_{mB} = 1,17719 \cdot 10^{-29}$  m for a proton energy of  $9,382720 \cdot 10^8$  MeV).
- 6.- Due to the variability in size of the tons, an excited electron can perfectly overcome the Penning trap ( $R_{mB} \ll 10^{-22}$  m).

As we mentioned at the beginning, Aspin Bubbles is not a model; a model or a theory would fail straight away when trying to explain the entire known physical phenomena. There is no theory or model that can cover it all, it has to stick to its field of action. Nevertheless, Aspin Bubbles slowly demonstrates that it is possible; this is why we are convinced of its future potential.

As we have seen, proton and antiproton are not a manipulation, but a perfect work of engineering and they show us how to structure all the matter, which means a lot of effort.

To check all the results of the proton and the antiproton, we attach herewith ANNEXES I and II, copies of the programme MATHEMATICA, which has been of great assistance in attaining Aspin Bubbles.

## REFERENCES

- [1] Lana-Renault, Yoël (2006): *Aspin Bubbles: Mechanical Project for the Unification of the Forces of Nature*. Journal online APEIRON, Vol 13, No 3, July, 344-374.  
<http://redshift.vif.com/JournalFiles/V13NO3PDF/V13N3LAN.PDF>  
<http://es.arxiv.org/abs/nucl-th/0106021v5>  
<http://es.arxiv.org/ftp/nucl-th/papers/0106/0106021.pdf>  
<http://www.yoel-lana-renault.es/>
- [2] Lana-Renault, Yoël (2010): *"Aspin Bubbles" and the Force of Gravity*. Infinite Energy Magazine. Issue 115 (May/June 2014).  
[http://www.yoel-lana-renault.es/Aspin\\_Bubbles\\_and\\_the\\_force\\_of\\_gravity.pdf](http://www.yoel-lana-renault.es/Aspin_Bubbles_and_the_force_of_gravity.pdf)  
[http://www.yoel-lana-renault.es/AB\\_y\\_la%20fuerza\\_de%20la\\_gravedad\\_v2.pdf](http://www.yoel-lana-renault.es/AB_y_la%20fuerza_de%20la_gravedad_v2.pdf)
- [3] Lana-Renault, Yoël (2009): *"Aspin Bubbles" and Gravitational Deflection*. Infinite Energy Magazine. Issue 99 (Sep/Oct 2011).  
<http://www.yoel-lana-renault.es/LanaRenaultIE99.pdf>  
[http://www.yoel-lana-renault.es/AB\\_y\\_la\\_deflexion\\_gravitatoria.pdf](http://www.yoel-lana-renault.es/AB_y_la_deflexion_gravitatoria.pdf)



- .- [4] Lana-Renault, Yoël (2008): *La transformada de "Aspin Bubbles", ensayo de un complemento a la transformada de Galileo*  
<http://www.yoel-lana-renault.es/LatransformadadeAspinBubbles.pdf>
  
- .- Lana-Renault, Yoël (2000): *Exact zero-energy solution for a new family of Anharmonic Potentials*. Revista Academia de Ciencias. Zaragoza. **55**: 103-109.  
<http://www.yoel-lana-renault.es/ExactzeroenergyAcadCiencias.pdf>  
<http://arxiv.org/abs/physics/0102054>
  
- .- Lana-Renault, Yoël (1998): *Modelo de constitución interna de la Tierra*. Tesis Doctoral, Departamento de Física Teórica, Universidad de Zaragoza, 146 pp.  
<http://zaguán.unizar.es/record/1906#>  
[http://zaguán.unizar.es/record/1906/files/TUZ\\_0029\\_lana\\_modelo.pdf](http://zaguán.unizar.es/record/1906/files/TUZ_0029_lana_modelo.pdf)
  
- .- Lana-Renault, Yoël (2006): Foro Astroseti, Astrofísica  
Tema: *Michelson-Morley, Bradley, Fizeau y "Aspin Bubbles"*  
<http://foros.astroseti.org/viewtopic.php?t=2922>
  
- .- Lana-Renault, Yoël (2009): Foro Astroseti, Astrofísica  
Tema: *"Aspin Bubbles" y la fuerza de la gravedad*  
<http://foros.astroseti.org/viewtopic.php?f=2&t=6379>
  
- .- Lana-Renault, Yoël (2007): Foro Astroguía, Astronomía  
Tema: *"Aspin Bubbles", una alternativa al Big Bang*  
<http://www.astroguia.org/foros/viewtopic.php?t=4785>







**Passive mass M of the membrane of the tons**

$$M_A = \frac{m_A}{g_{AB}}$$

$$4.1438827184775380476687083645165084708749739281761296115527542197659 \times 10^{-28}$$

$$M_B = \frac{m_B}{g_{AB}}$$

$$8.2787430344476521927252333255751078905577624952179934128722749121171 \times 10^{-28}$$


---

**Aspin of the positon A:**

$$HA = \frac{G * m_A^2}{k * e^2}$$

$$5.06363117840849258720359000488372701369703018544279587571389096296972 \times 10^{-28}$$

$$aspin_A = \sqrt{1 + HA} + \delta_A * \sqrt{HA}$$

$$1.00000000000000000000225025135893937248575157034344400369843690412419589121995282130225628$$

**Aspin of the negaton B:**

$$HB = \frac{G * m_B^2}{k * e^2}$$

$$2.02104488998637199826848966176999880633573750787133451383033482706435 \times 10^{-27}$$

$$aspin_B = \sqrt{1 + HB} + \delta_B * \sqrt{HB}$$

$$0.999999999999999999995504396714581710338969098523361580173065490483666954825602197637464867$$


---

**Energy of the tons**

$$E_{nA} = \tau_A * m_A * c^2$$

$$3.760240486633186131353766333100 \times 10^{-11}$$

**Energy positon A in eV**

$$\frac{E_{nA}}{e}$$

$$2.34695761302262346556901881354131527944299946741512849428052893783277 \times 10^8$$

$$E_{nB} = \tau_B * m_B * c^2$$

$$7.512293868200913100709930133800 \times 10^{-11}$$

**Energy negaton B in eV**

$$\frac{E_{nB}}{e}$$

$$4.68880523676921532097801601148747298023298699291610222747203895096294 \times 10^8$$

**Energy proton**

$$E_{nB} + 2 * E_{nA}$$

$$1.5032774841467285363417462800 \times 10^{-10}$$

**Energy proton in eV**

$$\frac{E_{nB} + 2 * E_{nA}}{e}$$

$$9.38272046281446225211605363857010353911898592774635921603309682662847 \times 10^8$$

**Verification Energy proton**

$$\frac{E_{nB} + 2 * E_{nA}}{\tau_A * m_p * c^2}$$

$$1.00$$



$$roA1 = AoA1$$

$$5.97378498514301711105255014458864002036355112964010626488833539202286 \times 10^{-17}$$

Balance position radius (in m) of the membrane of positon A (equation 14)

$$RA1 = \frac{v_{iA}}{\omega_A} + \text{Aspin}n_A$$

$$5.9737849851430171118697532239693695364371562382703891910772091805982 \times 10^{-16}$$

$$RRR1 = \frac{h}{m_A + c} + \sqrt{\frac{gAB}{2 + \tau_A}} + \text{Aspin}n_A$$

$$5.9737849851430171118697532239693695364371562382703891910772091805982 \times 10^{-16}$$

$$\frac{RA1}{RRR1}$$

$$1.000$$

Resolution equations 5, 24 and 25 from Aspin Bubbles[1] with the last modifications for positon A

Clear[xA, roA, AoA]

AAA =

FindRoot[

$$\left\{ \frac{M_A + xA^2 + \omega_A^2}{E_{m_A} + (2 + xA)^{2+\tau_A}} + \left( roA^2 - 2 + xA + AoA^2 - roA + \sqrt{roA^2 + 4 + xA + (xA - 1) + AoA^2} \right) + \left( roA + (2 + xA - 1) + \sqrt{roA^2 + 4 + xA + (xA - 1) + AoA^2} \right)^{\wedge} (2 + (xA - 1)) \dots - \zeta,$$

$$1 / \left( k + e^2 + \left( \text{ArcSin} \left[ \frac{-roA + \sqrt{roA^2 + 4 + xA + (xA - 1) + AoA^2}}{2 + xA + AoA} \right] \right)^{\wedge} 2 - \left( \frac{Bi}{2} \right)^2 \right) + 2 * m_A + v_{iA} + \omega_A + \text{ArcSin} \left[ \frac{-roA + \sqrt{roA^2 + 4 + xA + (xA - 1) + AoA^2}}{2 + xA + AoA} \right] + RA1^2 == \delta_A,$$

$$\left[ \left[ roA + \frac{-roA + \sqrt{roA^2 + 4 + xA + (xA - 1) + AoA^2}}{2 + xA} \right]^{\wedge} xA \right] / RA1 == \zeta,$$

{xA, {xA0, xA1}}, {roA, {roA0, roA1}}, {AoA, {AoA0, AoA1}}, WorkingPrecision -> X + digits }

$$\{xA \rightarrow 0.9937642015705142038219821157604341604574137046044868319669633262949379, roA \rightarrow 4.824533210578572635932276906354572089812942174026553201477542194430017 \times 10^{-16}, AoA \rightarrow 4.824439415581034405218634112792614316443590504971935282357404025922062 \times 10^{-16}\}$$

Exponent x for positon A

$$xA = \text{Re}[xA / AAA]$$

$$0.9937642015705142038219821157604341604574137046044868319669633262949379$$

Accuracy[xA]

$$\infty$$

Precision[xA]

$$\infty$$

Parameter ro for positon A

$$roA = \text{Re}[roA / AAA]$$

$$4.824533210578572635932276906354572089812942174026553201477542194430017 \times 10^{-16}$$

Accuracy[roA]

$$85$$

Precision[roA]

$$70$$

Other name:

$$r_{oA} = roA$$

$$4.824533210578572635932276906354572089812942174026553201477542194430017 \times 10^{-16}$$

Parameter Ao for positon A

$$\bar{r}_{oA} = \text{Re}[\text{AoA} / \bar{r}A]$$

$$4.824439415581034405218634112792614316443590504971935282357404025922062 \times 10^{-16}$$

$$\text{Accuracy}[\text{AoA}]$$

$$\infty$$

$$\text{Precision}[\text{AoA}]$$

$$\infty$$

Verification that  $r_{oA} > \text{AoA}$ :

$$\frac{r_{oA}}{\bar{r}_{oA}}$$

$$1.000019441636521604957066288695664255571020174045941600645014731444113$$

Verification equation (24). Potential + Energy = 0

$$\frac{M_A + X_A^2 * \Theta_A^2}{E_{mA} * (2 * X_A)^{2 * X_A}} * \left( r_{oA}^2 - 2 * X_A * \bar{r}_{oA}^2 - r_{oA} * \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2} \right) * \left( r_{oA} * (2 * X_A - 1) + \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2} \right)^{(2 * X_A - 1)}$$

$$-1.00532$$

Verification equation (25). Electric boundary condition

$$\frac{1}{k} * e^2 * \left( \text{ArcSin} \left[ \frac{-r_{oA} + \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2}}{2 * X_A * \bar{r}_{oA}} \right] \right)^2 - \left( \frac{\pi^2}{2} \right) * 2 * M_A * v_{IR} * \Theta_A * \text{ArcSin} \left[ \frac{-r_{oA} + \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2}}{2 * X_A * \bar{r}_{oA}} \right] * R_{A1}^2$$

$$1.00824$$

Verification equation (5)

Balance position radius or position of equilibrium of the membrane of positon A

$$R_{A1} = \left( r_{oA} + \frac{-r_{oA} + \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2}}{2 * X_A} \right)^{X_A}$$

$$5.9737849851430171118697532239693695364371562382703891910772091806871 \times 10^{-16}$$

$$\frac{R_{A1}}{R_{A1}}$$

$$1.001488$$

Others results

Maximum radius (in m) of the membrane of positon A

$$R_{IR} = (r_{oA} + \bar{r}_{oA})^{X_A}$$

$$1.19705698085688598670971630835107814890131470535047270414631696638239 \times 10^{-15}$$

Minimum radius (in m) of the membrane of positon A

$$R_{mA} = (r_{oA} - \bar{r}_{oA})^{X_A}$$

$$1.2504580503774307313057366542508644997603101155122878604819839490 \times 10^{-20}$$

$$\frac{R_{IR}}{R_{mA}}$$

$$95729.479329240474144829567277797857010397096415978683713115983307$$

Angle  $\varphi$  (in rad) in the position of equilibrium of the membrane of positon A

$$\Theta_{A1} = \text{ArcSin} \left[ \frac{-r_{oA} + \sqrt{r_{oA}^2 + 4 * X_A * (X_A - 1) * \bar{r}_{oA}^2}}{2 * X_A * \bar{r}_{oA}} \right]$$

$$-0.006274845257355169471456223412644409689491500609664945684865476043256$$







Resolution equations 5, 24 and 25 from Aspin Bubbles[1] with the lasts modifications for negaton B

```
Clear[xB, roB, AoB]
BBB =
FindRoot[
{

$$\left[ \frac{M_B * xB^2 * \omega_B^2}{E_{mB} * (2 * xB)^{2 * \kappa_B}} + \left( roB^2 - 2 * xB * AoB^2 - roB * \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2} \right) + \left( roB * (2 * xB - 1) + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2} \right) ^ (2 * (xB - 1)) - \xi, \right.$$


$$1 / \left( (k * e^2) * \left( \left[ \text{ArcSin} \left[ \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB * AoB} \right] / (2 * xB * AoB) \right] ^ 2 - \left( \frac{\beta_1}{2} \right)^2 \right) \right) + 2 * m_B * v_{1B} * \omega_B * \text{ArcSin} \left[ \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB * AoB} \right] * RB1^2 :: \delta_B, \right.$$


$$\left. \left( \left( roB + \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB} \right) ^ xB \right) / RB1 :: \zeta, \right.$$

{xB, {xB0, xB1}}, {roB, {roB0, roB1}}, {AoB, {AoB0, AoB1}}, WorkingPrecision -> \chi * digits]
{xB -> 1.006314550963447342096234713631105799464976812607001253254234503281417,
roB -> 3.718690206121780318797207241189201703009179754522886222208095047978041 * 10^-16,
AoB -> 3.718616072560607550928490250410768056913437451473212198380165051465305 * 10^-16}
```

Exponent x for the negaton B

```
x_B = Re[xB /. BBB]
1.006314550963447342096234713631105799464976812607001253254234503281417
Accuracy[xB]
∞
Precision[xB]
∞
```

Parameter ro for the negaton B

```
roB = Re[roB /. BBB]
3.718690206121780318797207241189201703009179754522886222208095047978041 * 10^-16
Accuracy[roB]
85
Precision[roB]
70
```

Other name:

```
r_oB = roB
3.718690206121780318797207241189201703009179754522886222208095047978041 * 10^-16
```

Parameter Ao for the negaton B

```
A_oB = Re[AoB /. BBB]
3.718616072560607550928490250410768056913437451473212198380165051465305 * 10^-16
Accuracy[AoB]
∞
Precision[AoB]
∞
```

Verification that roB > AoB:

```

$$\frac{r_{oB}}{A_{oB}}$$

1.000019935793243027674541605727122862570322496542085193172424473632559
```





*Relation between the position of equilibrium radii of the membranes of positron and negaton*

$$\frac{R_{A1}}{R_{B1}} / \left( \sqrt{\frac{r_B}{r_A}} * \frac{m_B}{m_A} * \frac{Aspin_A}{Aspin_B} \right)$$

1.0030257

*Relation between Total accelerations of the membranes of positron and negaton*

$$-\frac{a_A}{a_B} / \left( \frac{r_A}{r_B} * \frac{m_A}{m_B} * \left( \frac{Aspin_B}{Aspin_A} \right)^2 \right)$$

1.00115556

*Attractive Force (in N) that the positron **A** exerts over the negaton **B** and verifications*

$$f_{AB} = G_A * \sqrt{\frac{r_A}{r_B}} * m_A * a_B * \frac{R_{A1} * R_{B1}}{d^2}$$

-2.3070773523706157582696221631324986957202694606273829808778405931621  $\times 10^{-28}$

$$f_{AB} / \left( G_A * G_B * \frac{Aspin_A}{Aspin_B} * F_B \right)$$

0.99825405

$f_{AB} / -F_B$

1.000000000000000006745854644357662149815140450295276918189534171488

*Attractive Force (in N) that the negaton **B** exerts over the positron **A** and verifications*

$$f_{BA} = G_B * \sqrt{\frac{r_B}{r_A}} * m_B * a_A * \frac{R_{B1} * R_{A1}}{d^2}$$

-2.307077352370615755156980468656159305329601960917842886009928501831  $\times 10^{-28}$

$$f_{BA} / \left( G_B * G_A * \frac{Aspin_B}{Aspin_A} * F_B \right)$$

0.9980962

$f_{BA} / -F_B$

0.9980962

*Relation between Forces  $f_{AB}$  and  $f_{BA}$*

$$\frac{f_{AB}}{f_{BA}}$$

1.000000000000000000000013491709288715324304180936388870737884854558473307

$$\left( \frac{f_{AB}}{f_{BA}} \right) / \left( \frac{Aspin_A}{Aspin_B} \right)^2$$

0.9984443



# Values $\alpha$

Value "alimit"

$$\alpha_{\text{lim}} = \frac{51714564051}{100000000000} * \zeta$$

0.5171456405100

Value  $\alpha$  from Quantum Mechanics

$$\alpha = \frac{3 + \sqrt{3}}{10} * \zeta$$

0.5196152422706631880582339024517617100828415761431141884167420938355799

$$\alpha = \frac{\sqrt{3}}{2} * \zeta$$

0.8660254037844386467637231707529361834714026269051903140279034897259665

Relation between  $\alpha$  and "alimit"

$$\alpha = \alpha_{\text{lim}}$$

0.5171456405100

$$\frac{\alpha}{\alpha_{\text{lim}}}$$

1.000

# Results of the Negaton B

$x_B$

1.006314550963447342096234713631105799464976812607001253254234503281417

$r_{oB}$

3.718690206121780318797207241189201703009179754522886222208095047978041  $\times 10^{-16}$

$\bar{\lambda}_{oB}$

3.718616072560607550928490250410768056913437451473212198380165051465305  $\times 10^{-16}$

$R_{tB}$

5.9687783256051068334894500916904810352684427045860218875527429476305  $\times 10^{-16}$

$R_{B1}$

2.9901476903958943195743152832053794311754067634882105723532140778051  $\times 10^{-16}$

$R_{mB}$

5.5322659031748773682310049276270515262455734363359971660288423924  $\times 10^{-21}$

Bohr magneton

$$\mu_B = \frac{e * h}{2 * m_e}$$

9.27400967298573914857252849248050836006569680773371457220516030853332  $\times 10^{-24}$

spin angular momentum of the negaton

$$S_B = \alpha * h$$

5.45367170362771175856366837738592231402959684434796276415989479392829  $\times 10^{-25}$



*moment of inertia of the membrane of the negaton in its balance position*

$$I_B = \frac{2}{3} * M_B * R_{B1}^2$$

$$4.9346734982697342146701471594951752790759947257810399434663396112249 \times 10^{-59}$$

*angular velocity in its balance position*

$$\omega_{BS} = \frac{S_B}{I_B}$$

$$1.1051737679382346402596383479747555220527175879852470099688576592859 \times 10^{24}$$

*rotation kinetic energy of the membrane in its balance position*

$$E_{dB} = \frac{1}{2} * I_B * \omega_{BS}^2$$

$$3.01362745289818473937465951866603486433306046479272209255785048882771 \times 10^{-11}$$

*Relations*

$$\frac{E_{dB}}{E_{nB}}$$

$$0.4011594202477472299508407215284537596652104962634356843979953417680$$

$$\frac{E_{nB}}{E_{dB}}$$

$$2.4927745667356434162741017036152358190838672488928426165330719860641$$

*Total energy of the negaton in its balance position*

$$E_{TOTALB} = E_{nB} + E_{dB}$$

$$1.05259213210990978400845896524603486433306046479272209255785048882771 \times 10^{-10}$$

*Relations*

$$\frac{E_{dB}}{E_{TOTALB}}$$

$$0.2863053371734216194656736843561435694565833714324749999141167225694$$

$$\frac{E_{TOTALB}}{E_{dB}}$$

$$3.492774566735643416274101703615235819083867248892842616533071986064$$

*Tangential velocity of the membrane in its balance position*

$$v_{BStanR1} = \omega_{BS} * R_{B1}$$

$$3.3046327896866403891196282289245344232886814391129130631861795526740 \times 10^9$$

$$\frac{v_{BStanR1}}{c}$$

$$1.1023068464539692953582001815817976392483767684085345012869468359588$$

*moment of inertia of the membrane of the negaton in the position minimum radius*

$$I_{nB} = \frac{2}{3} * M_B * R_{nB}^2$$

$$1.6891928535268248529883431147214353618426239581889471617424057112 \times 10^{-68}$$

$$\frac{I_{nB}}{I_B}$$

$$3.4231096629171389067708253308683844752821786399451332870852193764 \times 10^{-10}$$

*angular velocity in the position minimum radius*

$$\omega_{nBS} = \frac{S_B}{I_{nB}}$$

$$3.2285666448571118898309429628012304209790195612214988556864687313 \times 10^{33}$$

$$\frac{\omega_{nES}}{\omega_{pS}}$$

$$2.9213203737908012793468507051576257514253089221660070400679316295 \times 10^3$$

*rotation kinetic energy of the membrane in the position minimum radius*

$$E_{nMB} = \frac{1}{2} I_{nB} * \omega_{nES}^2$$

$$0.08803771277166745419079563687596727528442092059195028346655118974$$

$$\frac{E_{nMB}}{E_{dB}}$$

$$2.921320373790801279346850705157625751425308922166007040067931629 \times 10^3$$

*Tangential velocity of the membrane in the position minimum radius*

$$v_{BStambnB} = \omega_{nES} * R_{nB}$$

$$1.7861289165470713653178635454952515394505798169449702628536085436 \times 10^{13}$$

$$\frac{v_{BStambnB}}{c}$$

$$59578.84759552794904926739502883863540858588967388133102579947304$$

*moment of inertia of the membrane of the negaton in the position maximum radius*

$$I_{nB} = \frac{2}{3} * M_B * R_{nB}^2$$

$$1.9662740311162058411988355520694021713998068243015251785184258568748 \times 10^{-58}$$

$$\frac{I_{nB}}{I_B}$$

$$3.9846081646650968067602350653103010120862277061960068930947069079573$$

*angular velocity in the position maximum radius*

$$\omega_{nES} = \frac{S_B}{I_{nB}}$$

$$2.7736071459641844840149846109880207323242555993978675778832313044702 \times 10^{23}$$

$$\frac{\omega_{nES}}{\omega_{pS}}$$

$$0.25096570570422680851832683222103356118056279497139932954150802374435$$

*rotation kinetic energy of the membrane in the position maximum radius*

$$E_{nMB} = \frac{1}{2} I_{nB} * \omega_{nES}^2$$

$$7.563171404462244695551056443947415642286599734667106123862352097600 \times 10^{-14}$$

$$\frac{E_{nMB}}{E_{dB}}$$

$$0.2509657057042268085183268322210335611805627949713993295415080237443$$

*Tangential velocity of the membrane in the position maximum radius*

$$v_{BStambnB} = \omega_{nES} * R_{nB}$$

$$1.6555046216574464211928047797729444956261564962107982827025450081238 \times 10^8$$

$$\frac{v_{BStambnB}}{c}$$

$$0.55221690121952514935942944227534386326228276770418229890978278316923$$



*Relations*

$$\frac{E_{nR}}{E_{nR}}$$

0.4011594202477472294096080938872351957395881054589507334404615105279

$$\frac{E_{nR}}{E_{nR}}$$

2.4927745667356434196372806812852956543270130104563146042593851366618

*Total energy of the positon in its balance position*

$$E_{TOTALA} = E_{nR} + E_{nR}$$

5.2686963802430619950368953918734774957027986442707293550854452632111  $\times 10^{-11}$

*Relations*

$$\frac{E_{nR}}{E_{TOTALA}}$$

0.2863053371734216191899913943089175332211471952866609246831306077954

$$\frac{E_{TOTALA}}{E_{nR}}$$

3.492774566735643419637280681285295654327013010456314604259385136662

*Tangential velocity of the membrane in its balance position*

$$V_{AS^{\text{tanRL}}} = \mathbf{0}_{RS} * \mathbf{R}_{RL}$$

3.3046327896866403868903709837041103806315519874214802595506231101034  $\times 10^8$

$$\frac{V_{AS^{\text{tanRL}}}}{C}$$

1.1023068464539692946146000056159219257715789459324824841159356684361

*moment of inertia of the membrane of the positon in the position minimum radius*

$$I_{nR} = \frac{2}{3} * M_R * R_{nR}^2$$

4.3197085897719127044290241447272646712672568655500529197383320968  $\times 10^{-68}$

$$\frac{I_{nR}}{I_R}$$

4.3816640846225436239028982112916259029269256377303326547839848113  $\times 10^{-10}$

*angular velocity in the position minimum radius*

$$\mathbf{0}_{nRS} = \frac{S_R}{I_{nR}}$$

1.2625091693779450202775467644438929465383144014437927238887968316  $\times 10^{23}$

$$\frac{\mathbf{0}_{nRS}}{\mathbf{0}_{RS}}$$

2.2822379367453142545031981700628239771063534210989466660428683741  $\times 10^9$

*rotation kinetic energy of the membrane in the position minimum radius*

$$E_{nR} = \frac{1}{2} I_{nR} * \mathbf{0}_{nRS}^2$$

0.03442655266303512360145202062775372425219291317363346540515358873

$$\frac{E_{nR}}{E_{nR}}$$

2.282237936745314254503198170062823977106353421098946666042868374  $\times 10^9$

*Tangential velocity of the membrane in the position minimum radius*

$$v_{AS\text{tan}BnA} = \omega_{nAS} * R_{nA}$$

$$1.5787147545239746021419875195381349096422203106701637464334578448 \times 10^{13}$$

$$\frac{v_{AS\text{tan}BnA}}{c}$$

$$52660.25586687623082706061669964142025354821670230822639418960449$$


---

*moment of inertia of the membrane of the positon in the position maximum radius*

$$I_{HR} = \frac{2}{3} * M_{HR} * R_{HR}^2$$

$$3.9586384956487390266003071270417308895680355186938342549788565965639 \times 10^{-58}$$

$$\frac{I_{HR}}{I_A}$$

$$4.0154153364554066949763163341049743051085931541617119369093075540136$$

*angular velocity in the position maximum radius*

$$\omega_{HR} = \frac{S_A}{I_{HR}}$$

$$1.3776634844586807087756459834921423399513524900512302261671356086918 \times 10^{13}$$

$$\frac{\omega_{HR}}{\omega_{HS}}$$

$$0.24904024022649332414721464560708508756538759050454771493876891221527$$

*rotation kinetic energy of the membrane in the position maximum radius*

$$E_{HR} = \frac{1}{2} I_{HR} * \omega_{HR}^2$$

$$3.756662181156731411350116881325804464338769367920459036059512185016 \times 10^{-12}$$

$$\frac{E_{HR}}{E_{AR}}$$

$$0.2490402402264933241472146456070850875653875905045477149387689122153$$

*Tangential velocity of the membrane in the position maximum radius*

$$v_{AS\text{tan}BnR} = \omega_{nRS} * R_{nR}$$

$$1.6491416913428857982655568162867298216596669019241022527214502407762 \times 10^8$$

$$\frac{v_{AS\text{tan}BnR}}{c}$$

$$0.55009445612633984216692896800183339557517050743287953318740601565641$$


---









graphs solutions for the equation (28)

```

Clear[x]

ao =  $\frac{(n + B)^2}{m_A * R_{A1} + k * e^2}$ 

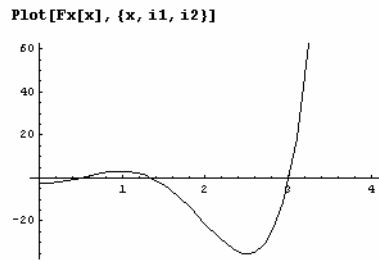
2.6053831734342073195492489761028964922971948199398902412418664094435

i1 =  $\frac{0}{3} * \zeta$ ;

i2 = 4 *  $\zeta$ ;

Fx[x_] :=  $\frac{\text{Aspin}_B}{\text{Aspin}_A} * x^3 * (4 * x^2 - 1) - x^3 * (x^2 - 1) - ao * (x^2 - 1) * (4 * x^2 - 1)$ 

```



- Graphics -

numerical solution for the equation (28)

```

Clear[x]

pr = 80;

 $\chi$  = 5;

x0 = 2 *  $\zeta$ ;

x1 = 1000000 *  $\zeta$ ;

Clear[x]

XXX = FindRoot[ $\frac{\text{Aspin}_B}{\text{Aspin}_A} * x^3 * (4 * x^2 - 1) - x^3 * (x^2 - 1) - ao * (x^2 - 1) * (4 * x^2 - 1) == 0$ , {x, {x0, x1}}, WorkingPrecision -> pr,
  MaxIterations ->  $\chi * pr$ ]

{x -> 3.0030120231661881097801357682689385381094999145522623338998840762282199421434887}

x = x /. XXX

3.0030120231661881097801357682689385381094999145522623338998840762282199421434887

Fx[x]

0.  $\times 10^{-66}$ 

Clear[F]

```

orbital radius r

```

r = x * R_{A1}

1.79393481341941287963534793888573014895293353003919311380905598758661  $\times 10^{-15}$ 

```

Relationship (65)

$$\frac{r}{R_{IR} + R_{IB}}$$

1. 00000000000112390347832416349695090277609086354798219395558176848956

Others Relationships

$$\frac{r}{R_{IR} + R_{mB}}$$

1. 4986141440011824222507386895727517654034448501177767061409090394242

$$\frac{r}{R_{IB} + R_{mA}}$$

3. 0054680094370474593247589980973216973630122510182539774442093384471

$$\frac{r}{R_{mB} + R_{mA}}$$

99459. 44944833875156355365525346569750372799218700242646853433460

$$\frac{r}{R_{A1} + R_{B1}}$$

2. 0012809983666700830951837426969194298211017618662136606016763415579

Diameters  $\phi$

$\phi_{\text{maximumpositon}} = 2 * R_{IR}$

2. 39411396171377197341943261670215629780262941070094540829263393276478  $\times 10^{-15}$

$\phi_{\text{balancepositon}} = 2 * R_{A1}$

1. 19475699702860342237395064479387390728743124765407783821544183613742  $\times 10^{-15}$

$\phi_{\text{minimumpositon}} = 2 * R_{mA}$

2. 5009161007548614626114733085017289995206202310245757209639678980  $\times 10^{-20}$

$\phi_{\text{maximumnegaton}} = 2 * R_{IB}$

1. 19375566512102136669789001833809620705368854091720437751054858952611  $\times 10^{-15}$

$\phi_{\text{balancenegaton}} = 2 * R_{B1}$

5. 9802953807917886391486305664107588623508135269764211447064281556101  $\times 10^{-16}$

$\phi_{\text{minimumnegaton}} = 2 * R_{mB}$

1. 1064531806349754736462009855254103052491146872671994332057684785  $\times 10^{-20}$

$\phi_{\text{orbit}} = 2 * r$

3. 5878696268388257592706958777714602979058670600783862276181119751732  $\times 10^{-15}$

$\phi_{\text{maximumorbit}} = 2 * (r + R_{IR})$

5. 9819835885525977326901284944736165957084964707793316359107459079380  $\times 10^{-15}$

$\phi_{\text{minimumorbit}} = 2 * (r + R_{mA})$

3. 5878946359998333078853219925045453151958622662806964733753216148522  $\times 10^{-15}$























Resolution equations 5, 24 and 25 from Aspin Bubbles[1] with the lasts modifications for negaton B

```

Clear[xB, roB, AoB]

BBB =
FindRoot[

$$\left[ \frac{M_B * xB^2 + \theta_B^2}{E_{nB} * (2 * xB)^{2 * xB}} * \left( roB^2 - 2 * xB * AoB^2 - roB * \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2} \right) * \left( roB * (2 * xB - 1) + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2} \right)^{2 * (xB - 1)} - \zeta, \right.$$


$$1 / \left( (k * e^2) * \left( \left( \text{ArcSin} \left[ \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB * AoB} \right] / (2 * xB * AoB) \right)^2 - \left( \frac{p1}{2} \right)^2 \right) \right) * 2 * m_B * v_{1B} * \theta_B * \text{ArcSin} \left[ \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB * AoB} \right] * RB1^2 := \delta_B, \left. \right]$$


$$\left( \left( roB + \frac{-roB + \sqrt{roB^2 + 4 * xB * (xB - 1) * AoB^2}}{2 * xB} \right)^{xB} \right) / RB1 := \zeta,$$

{xB, {xB0, xB1}}, {roB, {roB0, roB1}}, {AoB, {AoB0, AoB1}}, WorkingPrecision -> \chi * digits]

{xB -> 1.006314550963447342094807937865863048996303552587486283887206097091562,
roB -> 7.397091216233306619381588271698775448089221366752699068084565784405413 * 10^-16,
AoB -> 7.396943752292030618463044958065785704260799327501165374251482369473474 * 10^-16}

```

Exponent x for the negaton B

```

xB = Re[xB /. BBB]

1.006314550963447342094807937865863048996303552587486283887206097091562

Accuracy[xB]

∞

Precision[xB]

∞

```

Parameter ro for the negaton B

```

roB = Re[roB /. BBB]

7.397091216233306619381588271698775448089221366752699068084565784405413 * 10^-16

Accuracy[roB]

85

Precision[roB]

70

```

Other name:

```

r_nB = roB

7.397091216233306619381588271698775448089221366752699068084565784405413 * 10^-16

```

Parameter Ao for the negaton B

```

AoB = Re[AoB /. BBB]

7.396943752292030618463044958065785704260799327501165374251482369473474 * 10^-16

Accuracy[AoB]

∞

Precision[AoB]

∞

```













*spin angular momentum of the negaton*

$$S_B = \alpha * \hbar$$

$$5.45367170362771175856366837738592231402959684434796276415989479392829 \times 10^{-35}$$

*moment of inertia of the membrane of the negaton in its balance position*

$$I_B = \frac{2}{3} * M_B * R_{B1}^2$$

$$9.858602819262061139711454971073854143924308699606286399296524443349 \times 10^{-59}$$

*angular velocity in its balance position*

$$\omega_{BS} = \frac{S_B}{I_B}$$

$$5.5318910839699813555712203610664488426397291571165277368464940965282 \times 10^{23}$$

*rotation kinetic energy of the membrane in its balance position*

$$E_{dB} = \frac{1}{2} * I_B * \omega_{BS}^2$$

$$1.5084558936098758650408910285717689549176142902526811027608097225352 \times 10^{-11}$$

*Relations*

$$\frac{E_{dB}}{E_{nB}}$$

$$0.4011594202477472297706919061127648043416648284561999867784945773898$$

$$\frac{E_{nB}}{E_{dB}}$$

$$2.4927745667356434173935329387547408263031381701757643971300969792619$$

*Total energy of the negaton in its balance position*

$$E_{TOTALB} = E_{nB} + E_{dB}$$

$$5.2686963802430619963946573616717689549176142902526811027608097225352 \times 10^{-11}$$

*Relations*

$$\frac{E_{dB}}{E_{TOTALB}}$$

$$0.2863053371734216193739130708108453501002578648547282045209774940624$$

$$\frac{E_{TOTALB}}{E_{dB}}$$

$$3.492774566735643417393532938754740826303138170175764397130096979262$$

*Tangential velocity of the membrane in its balance position*

$$v_{BStanB1} = \omega_{BS} * R_{B1}$$

$$3.3046327896866403883776218688617047894392440947798920959840978468703 \times 10^8$$

$$\frac{v_{BStanB1}}{c}$$

$$1.1023068464539692951106935014561656482496447908572443460149013644867$$

*moment of inertia of the membrane of the negaton in the position minimum radius*

$$I_{nB} = \frac{2}{3} * M_B * R_{nB}^2$$

$$3.3747078573478883991428622436413070182732664089279132635006136231 \times 10^{-68}$$

$$\frac{I_{nB}}{I_B}$$

$$3.4231096629172174759267215769297348013282066221016290176614453050 \times 10^{-10}$$

angular velocity in the position minimum radius

$$\omega_{nES} = \frac{S_B}{I_{nE}}$$

$$1.6160426129192815877598294032384351814883864564088114207960585234 \times 10^{23}$$

$$\frac{\omega_{nES}}{\omega_{ES}}$$

$$2.9213203737907342275435276282715065998710674595681462901259962568 \times 10^9$$

rotation kinetic energy of the membrane in the position minimum radius

$$E_{nE} = \frac{1}{2} I_{nE} * \omega_{nES}^2$$

$$0.04406682934967238584362040325754650948548291497073351861621651417$$

$$\frac{E_{nE}}{E_{uE}}$$

$$2.921320373790734227543527628271506599871067459568146290125996257 \times 10^9$$

Tangential velocity of the membrane in the position minimum radius

$$V_{ES\text{tan}nE} = \omega_{nES} * R_{nE}$$

$$1.7861289165470508667944765630392060654768004709208650892086253765 \times 10^{13}$$

$$\frac{V_{ES\text{tan}nE}}{c}$$

$$59578.84759552726529212674733262322648146140057068630756577022950$$

moment of inertia of the membrane of the negaton in the position maximum radius

$$I_{nE} = \frac{2}{3} * M_B * R_{nE}^2$$

$$3.9282669285821950518239190185470173213105437531738702722813706946824 \times 10^{-58}$$

$$\frac{I_{nE}}{I_B}$$

$$3.9846081646650968058746262467159198849636597895208469514428820551808$$

angular velocity in the position maximum radius

$$\omega_{nES} = \frac{S_B}{I_{nE}}$$

$$1.3883149497674465731815178448398420714946137824348302604603178601224 \times 10^{13}$$

$$\frac{\omega_{nES}}{\omega_{ES}}$$

$$0.25096570570422680857410582803481792719853460111586711085574553242343$$

rotation kinetic energy of the membrane in the position maximum radius

$$E_{nE} = \frac{1}{2} I_{nE} * \omega_{nES}^2$$

$$3.785706978635025712641558683825736173573720486092044056011348992469 \times 10^{-11}$$

$$\frac{E_{nE}}{E_{uE}}$$

$$0.2509657057042268085741058280348179271985346011158671108557455324234$$



rotation kinetic energy of the membrane in its balance position

$$E_{\text{rot}} = \frac{1}{2} * I_A * \omega_{\text{RS}}^2$$

$$3.01362745289818473339554301273500161307386949149979279672881594860240 \times 10^{-11}$$

Relations

$$\frac{E_{\text{rot}}}{E_{\text{mR}}}$$

$$0.4011594202477472292294592784715462406590939822812063440424372462362$$

$$\frac{E_{\text{mR}}}{E_{\text{rot}}}$$

$$2.4927745667356434207567119164248006630565880110602091899541418428901$$

Total energy of the positon in its balance position

$$E_{\text{TOTALA}} = E_{\text{mR}} + E_{\text{rot}}$$

$$1.05259213210990978346653602611500161307386949149979279672881594860240 \times 10^{-10}$$

Relations

$$\frac{E_{\text{rot}}}{E_{\text{TOTALA}}}$$

$$0.2863053371734216190982307807636193139177328087116123148351424030981$$

$$\frac{E_{\text{TOTALA}}}{E_{\text{rot}}}$$

$$3.492774566735643420756711916424800663056588011060209189954141842890$$

Tangential velocity of the membrane in its balance position

$$v_{\text{AStanR1}} = \omega_{\text{RS}} * R_{\text{R1}}$$

$$3.3046327896866403861483646236412807472826613481057355927309424066833 \times 10^8$$

$$\frac{v_{\text{AStanR1}}}{c}$$

$$1.1023068464539692943670933254902899349398113771446964128533688484863$$

moment of inertia of the membrane of the positon in the position minimum radius

$$I_{\text{mR}} = \frac{2}{3} * M_{\text{R}} * R_{\text{mR}}^2$$

$$2.1622081636707670205705775133570051449114855531168068644383882418 \times 10^{-66}$$

$$\frac{I_{\text{mR}}}{I_{\text{A}}}$$

$$4.3816640846226429398531154484069255500002779332726480337654353202 \times 10^{-10}$$

angular velocity in the position minimum radius

$$\omega_{\text{mRS}} = \frac{S_{\text{R}}}{I_{\text{mR}}}$$

$$2.5222694998843441888579190522236284170118291166621721534308314491 \times 10^{23}$$

$$\frac{\omega_{\text{mRS}}}{\omega_{\text{RS}}}$$

$$2.2822379367452625246980528702979671512818169781480288538814208756 \times 10^9$$

*rotation kinetic energy of the membrane in the position minimum radius*

$$E_{mR} = \frac{1}{2} I_{mR} * \omega_{mR}^2$$

$$0.06877814900221233949415413533185739982490824323942844637079375832$$

$$\frac{E_{mR}}{E_{dR}}$$

$$2.282237936745262524698052870297967151281816978148028853881420876 \times 10^9$$

*Tangential velocity of the membrane in the position minimum radius*

$$v_{AS\text{tan}mR} = \omega_{mR} * R_{mR}$$

$$1.5787147545239567100056509781953253423390772310875855740766877410 \times 10^{13}$$

$$\frac{v_{AS\text{tan}mR}}{c}$$

$$52660.25586687563400963379066044834731429692040777041742913651754$$

*moment of inertia of the membrane of the positon in the position maximum radius*

$$I_{HR} = \frac{2}{3} * M_R * R_{HR}^2$$

$$1.9814763645352343610002310825351318954060833556964554618463389896978 \times 10^{-58}$$

$$\frac{I_{HR}}{I_R}$$

$$4.0154153364554066940656020592560566471072229739834669812823817880736$$

*angular velocity in the position maximum radius*

$$\omega_{HR} = \frac{S_R}{I_{HR}}$$

$$\frac{\omega_{HR}}{\omega_{RS}}$$

$$0.24904024022649332420369809321633837368736720583223106011091163308679$$

*rotation kinetic energy of the membrane in the position maximum radius*

$$E_{HR} = \frac{1}{2} I_{HR} * \omega_{HR}^2$$

$$7.505145048229191214270299279978704341243139894737189648701449694640 \times 10^{-12}$$

$$\frac{E_{HR}}{E_{dR}}$$

$$0.2490402402264933242036980932163383736873672058322310601109116330868$$

*Tangential velocity of the membrane in the position maximum radius*

$$v_{AS\text{tan}HR} = \omega_{HR} * R_{HR}$$

$$1.6491416913428857980822828487572159235646380279044265609241555652346 \times 10^9$$

$$\frac{v_{AS\text{tan}HR}}{c}$$

$$0.55009445612633984210579535284947559406735910211070972336607466130271$$

## Spin magnetic moment of the positron A and verifications

$$\mu_{SA} = \frac{g_{AB}}{2} * \frac{e * S_A}{m_A}$$

$$5.2772171816412206903968109450757542395737395161009422787107324325582 \times 10^{-27}$$

$$\mu_{SA} / \frac{\omega_{nAS} * e * R_{nA}^2}{3}$$

$$1.00$$

$$\mu_{SA} / \frac{\omega_{AS} * e * R_{A1}^2}{3}$$

$$1.00$$

$$\mu_{SA} / \frac{\omega_{nAS} * e * R_{nA}^2}{3}$$

$$1.00$$

$$\frac{S_B}{S_A}$$

$$1.00$$

## TESTS and Verifications

*spin angular momentum of the positron*

$$S = S_A$$

$$5.45367170362771175856366837738592231402959684434796276415989479392829 \times 10^{-35}$$

*spin magnetic moment of the positron*

$$\mu_S = \frac{g_{AB}}{2} * \frac{e * S}{m_A}$$

$$5.2772171816412206903968109450757542395737395161009422787107324325582 \times 10^{-27}$$

$$\frac{\mu_S}{\mu_{SB}}$$

$$0.5005449137912532072260223487746211254262345232655995146615062766645$$

$$\frac{\mu_S}{\mu_{SA}}$$

$$1.00$$

*Value of the angular momentum J of the antiproton according to (84)*

$$J = -S$$

$$-5.45367170362771175856366837738592231402959684434796276415989479392829 \times 10^{-35}$$

*Value  $\alpha$  selected*

$$\alpha$$

$$0.51714564051000$$

*Value n according to (85)*

$$n = \alpha * \sin[\theta]$$

$$0.116225830467140893822819074578100446884362688996607254486054380057457$$

*orbital angular momentum of one negaton*

$$L = n * \hbar$$

$$1.22568474564375842772332158024439066614763492176521245004394999874983 \times 10^{-35}$$







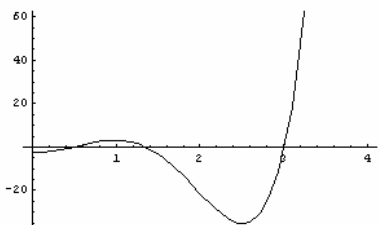
graphs solutions for the equation (92)

```

Clear[x]
a0 = (n + b)^2 / (mB + RB1 + k * e^2)
2.6053831734342073207218023814185164549158105139443123571586332294236

i1 = 0 / 3 * z;
i2 = 4 * z;
Fx[x_] := (RspinA / RspinB) * x^3 * (4 + x^2 - 1) - x^3 * (x^2 - 1) - a0 * (x^2 - 1) * (4 + x^2 - 1)
Plot[Fx[x], {x, i1, i2}]

```



- Graphics -

numerical solution for the equation (92)

```

Clear[x]
pr = 80;
chi = 5;
x0 = 2 * z;
x1 = 10000000 * z;
Clear[x]
XXX = FindRoot[(RspinA / RspinB) * x^3 * (4 + x^2 - 1) - x^3 * (x^2 - 1) - a0 * (x^2 - 1) * (4 + x^2 - 1) == 0, {x, {x0, x1}}, WorkingPrecision -> pr,
  MaxIterations -> chi * pr]
{x -> 3.0030120231661881041555932915141925087942069645913528701377597059929751352658236}
x = x /. XXX
3.0030120231661881041555932915141925087942069645913528701377597059929751352658236
Fx[x]
-0. * 10^-66
Clear[r]

```

orbital radius r of the negatons

```

r = x * RB1
1.79393481341941287546800634894293154075093944422140740662726008554927 * 10^-15

```

Relationship (93)

$$\frac{r}{R_{1R} + R_{1B}}$$

1. 00128259056483280537904166952899095857516583515684031194842596792928

Others Relationships

$$\frac{r}{R_{A1} + R_{B1}}$$

2. 0012809983666700784461733799631786554192243566632810443354585676874

$$\frac{r}{R_{nE} + R_{nA}}$$

103626. 22634815538366839294829977268538796463700621272226391553997

$$\frac{r}{R_{1R} + R_{nE}}$$

2. 9939239928159557771255623084723701500405661490727687870281783186128

$$\frac{r}{R_{1E} + R_{nA}}$$

1. 5043953458005583876380584824870331430770382165389993557585005621717

Diameters  $\phi$

$\phi_{\text{maximumpositon}} = 2 * R_{1R}$

1. 19836156657245567414086620871120297768427775843955724723566732100834  $\times 10^{-15}$

$\phi_{\text{balancepositon}} = 2 * R_{A1}$

5. 9802953807917886445256376787426361929524124163761534112053805654824  $\times 10^{-16}$

$\phi_{\text{minimumpositon}} = 2 * R_{nA}$

1. 2518208340515134381865562143180029777044485670248826246761940235  $\times 10^{-20}$

$\phi_{\text{maximumnegaton}} = 2 * R_{1E}$

2. 38491218715862156767455281073460078064221798678495510268758233116233  $\times 10^{-15}$

$\phi_{\text{balancenegaton}} = 2 * R_{B1}$

1. 19475699702860342183624993356068617422727135871410461156554659513222  $\times 10^{-15}$

$\phi_{\text{minimumnegaton}} = 2 * R_{nE}$

2. 2104973003410087466138263684176245307499612502464839557869551436  $\times 10^{-20}$

$\phi_{\text{orbit}} = 2 * r$

3. 5878696268388257509360126978858630815018788884428148132545201710985  $\times 10^{-15}$

$\phi_{\text{maximumorbit}} = 2 * (r + R_{1E})$

5. 9727818139974473186105655086204638621440968752277699159421025022609  $\times 10^{-15}$

$\phi_{\text{minimumorbit}} = 2 * (r + R_{nE})$

3. 5878917318118291610234788361495472577471863880553172780940780406500  $\times 10^{-15}$

