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Review Article

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Aspin Bubbles and the Antimatter

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ABSTRACT
In this article, we will demonstrate and verify that it is not possible to obtain antinuclei in general. Only antiparticles such as the antineutron and antiproton can be formed, and with these, only three antinuclei can be obtained. Therefore, according to Aspin Bubbles, the existence of antimatter in our universe is not possible. The present experimentation corroborates this fact, since to date only hydrogen antinuclei have been obtained.

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1.- Introduction to Aspin Bubbles

Aspin Bubbles considers that all physical phenomena existing in our Universe can be explained mechanically. The theory is based on the hypothesis that the primary components of the matter are exclusively two pulsating particles (tons) that generate spherical waves in an elastic medium that fills the entire universe. The mechanical interaction between these particles and their waves reproduces all the forces of nature.

The mechanical wave-particle interaction leads us to the understanding and obtaining of the electrical forces, and considering that these forces have a small, as yet unobserved, asymmetry in value, the force of gravity is obtained.

Furthermore, the theory obtains a force yet undetected, which it calls Yannoe, with which it can explain many inexplicable phenomena of nature.

And finally, the antiparticles are obtained by simply exchanging positons for negatons and negatons for positons in the particles.
The theory is published by LAP LAMBERT Academic Publishing under the title: The mechanics of "Aspin Bubbles", the origin of all known forces [1].

2.- Data entry

We'll perform the entire calculation with at least 70 significant decimals. This is essential to verify that Aspin Bubbles obtains all the forces. All calculations are performed using WOLFRAM's MATHEMATICA 4 program.
significant decimal places

```
digits = 70;

ξ = N[1, digits]

1.000000000000000000000000000000000000000000000000000000000000000000000
 00


π * ξ

3.141592653589793238462643383279502884197169399375105820974944592307816
```

Planck constant in J/Hz (CODATA 2022)

$$h = \frac{662\,607\,015}{100\,000\,000} * 10^{-34} * \zeta$$

6.62607015000000000000000000000000000000000000000000000000000000000000000000

reduced Planck constant in J·s (CODATA 2022)

$$\hbar = \frac{h}{2 * \pi}$$

$1.054571817646156391262428003302280744722826330020413122421923470598436 \times 10^{-34}$

speed of light in vacuum in m/s (CODATA 2022)

$$c = \frac{299\,792\,458}{100\,000\,000} * 10^{8} * \zeta$$

$2.99792458000000000000000000000000000000000000000000000000000000000000000 \times 10^{8}$

Newtonian constant of gravitation in m^3 / kg · s^2 (CODATA 2022)

$$G = \frac{667\,430}{100\,000} * 10^{-11} * \zeta$$

$6.67430000000000000000000000000000000000000000000000000000000000000000000 \times 10^{-11}$

Coulomb constant in N·m^2 / C^2 (CODATA 2022)

$$k = c^2 * 10^{-7}$$

$8.98755178736817640000000000000000000000000000000000000000000000000000000000 \times 10^{9}$

electric charge of the electron in C (CODATA 2022)

$$e = \frac{1\,602\,176\,634}{1\,000\,000\,000} * 10^{-19} * \zeta$$

$1.602176634000000000000000000000000000000000000000000000000000000000000000000 \times 10^{-19}$

large distance s = 1 m between two particles

$$s = \frac{10\,000}{10\,000} * \zeta$$

1.00000000000000000000000000000000000000000000000000000000000000000000000000
00

Electric force in N between two charges **e** separated by a distance **s**

$$F_E = \frac{k * e^2}{s^2}$$

$2.3070775510857189718298497990348238400000000000000000000000000000000 0$
$\times 10^{-28}$

Factor Λ, ratio between the mass **m** of a ton and its passive mass **M**

$$\Lambda = \frac{\pi^2}{8} * \varsigma$$

$1.233700550136169827354311374984518891914212425905098828301668672027506$

Mass of the electron in kg (CODATA 2022)

$$m_o = \frac{91\,093\,837\,139}{10\,000\,000\,000} * 10^{-31} * \varsigma$$

$9.10938371390000000000000000000000000000000000000000000000000000000000 0$
$\times 10^{-31}$

$$mo = m_o$$

$9.10938371390000000000000000000000000000000000000000000000000000000000 0$

Mass of the antiproton in kg (CODATA 2022)

$$m_p = \frac{167\,262\,192\,595}{100\,000\,000\,000} * 10^{-27} * \varsigma$$

$1.67262192595000000000000000000000000000000000000000000000000000000000 0$
$\times 10^{-27}$

$$mp = m_p$$

$1.67262192595000000000000000000000000000000000000000000000000000000000 0$
$\times 10^{-27}$

Mass of the antineutron in kg (CODATA 2022)

$$m_n = \frac{100\,137\,841\,946}{100\,000\,000\,000} * mp$$

$1.67492750056195215898700000000000000000000000000000000000000000000000 0$
$\times 10^{-27}$

$\mathbf{mn} = \mathbf{m_n}$

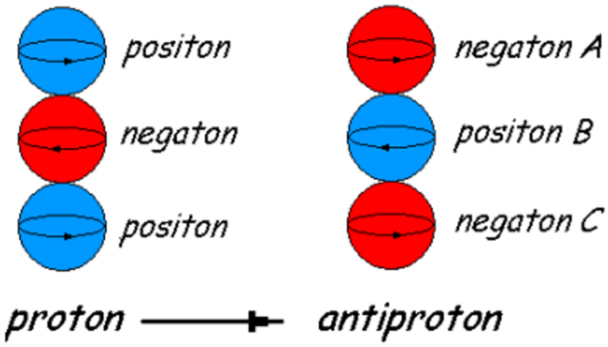
$1.674927500561952158987000000000000000000000000000000000000000000000000 \times 10^{-27}$

See also: "ASPIN BUBBLES" and the nuclear forces [3]

3.- The antiproton

We consider a possible configuration of the antiproton to be the mechanical union of three tons of equal mass: two negatons attached to a central positon. See: the proton in "Aspin Bubbles", version 5 [2]

mass of the tons A, B, C, of the antiproton
Info: (τi = excited energy and δi)



NEGATONS A, C,

$$m_A = \frac{mp}{3} * \xi; \qquad \tau_A = 1 * \xi; \qquad \delta_A = -1 * \xi;$$

$$m_C = \frac{mp}{3} * \xi; \qquad \tau_C = 1 * \xi; \qquad \delta_C = -1 * \xi;$$

POSITON B

$$m_B = \frac{mp}{3} * \xi; \qquad \tau_B = 1 * \xi; \qquad \delta_B = 1 * \xi;$$

m_A

$5.5754064198333333333333333333333333333333333333333333 \times 10^{-28}$

m_B

$5.5754064198333333333333333333333333333333333333333333 \times 10^{-28}$

m_C

$5.5754064198333333333333333333333333333333333333333333 \times 10^{-28}$

Antiproton mass check.

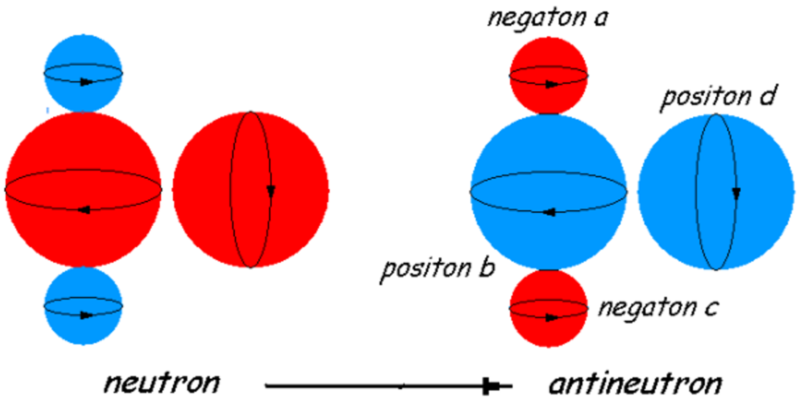
$$\frac{m_A + m_B + m_C}{mp}$$

1.0000000000000000000000000000000000000000000000000000000000000000000000

4.- The antineutron

We consider a possible configuration of the antineutron to be the mechanical union of for tons: two negatons a, c, attached to two positons b, d.

mass of the tons a, b, c, d, of the antineutron



NEGATONS a, c,

$$m_a = \frac{mn}{3} * \xi; \qquad \tau_a = 1 * \xi; \qquad \delta_a = -1 * \xi;$$

$$m_c = \frac{mn}{3} * \xi; \qquad \tau_c = 1 * \xi; \qquad \delta_c = -1 * \xi;$$

POSITONS b, d,

$$m_b = \frac{mn}{6} * \xi; \qquad \tau_b = 1 * \xi; \qquad \delta_b = 1 * \xi;$$

$$m_d = \frac{mn}{6} * \xi; \qquad \tau_d = 1 * \xi; \qquad \delta_d = 1 * \xi;$$

m_a

$5.5830916685398405299566666666666666666666666666666666666666666666666667 \times 10^{-28}$

m_b

$2.7915458342699202649783333333333333333333333333333333333333333333333333 \times 10^{-28}$

m_c

$5.583091668539840529956666666666666666666666666666666666666666666667 \times 10^{-28}$

m_d

$2.791545834269920264978333333333333333333333333333333333333333333333 \times 10^{-28}$

Antineutron mass check.

$$\frac{m_a + m_b + m_c + m_d}{mn}$$

1.000000000000000000000000000000000000000000000000000000000000000000000

5.- Aspin factors of the tons

5.1 - Aspin factors of the tons of the antiproton:

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

$8.9928343143176226913828209913206146361247768206068665677579652522 3778 \times 10^{-38}$

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

0.99999999999999999970011945187595740476058839994214133796234238664900
67575177108080891669

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

$8.99283431431762269138282099132061463612477682060686656775796525223778 \times 10^{-38}$

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

1.00000000000000000029988054812404259532933994320103488895148582326419
9388841515183391783

$$HC = \frac{G * m_C{}^2}{k * e^2}$$

$8.99283431431762269138282099132061463612477682060686656775796525223778 \times 10^{-38}$

$$\mathbf{Aspin_C} = \sqrt{1 + HC} + \delta_C * \sqrt{HC}$$

0.999999999999999999970011945187595740476058839994214133796234238664900
6757517710808089166 9

5.2 - Aspin factors of the tons of the antineutron:

$$Ha = \frac{G * m_a{}^2}{k * e^2}$$

$9.0176431967032234747796527037848808511497827030241276766401572497884 9 \times 10^{-38}$

$$\mathbf{Aspin_a} = \sqrt{1 + Ha} + \delta_a * \sqrt{Ha}$$

0.999999999999999999969970609069274775795350355655650279653495057643044
72595654975834974496

$$Hb = \frac{G * m_b{}^2}{k * e^2}$$

$2.2544107991758058686949131759462202127874456757560319191600393124471 2 \times 10^{-38}$

$$\mathbf{Aspin_b} = \sqrt{1 + Hb} + \delta_b * \sqrt{Hb}$$

1.000000000000000000015014695465362612105706438370938568976294840942396
96734084911269818286

$$Hc = \frac{G * m_c{}^2}{k * e^2}$$

$9.0176431967032234747796527037848808511497827030241276766401572497884 9 \times 10^{-38}$

$$\mathbf{Aspin_c} = \sqrt{1 + Hc} + \delta_c * \sqrt{Hc}$$

0.999999999999999999969970609069274775795350355655650279653495057643044
72595654975834974496

$$Hd = \frac{G * m_d{}^2}{k * e^2}$$

$2.2544107991758058686949131759462202127874456757560319191600393124471 2 \times 10^{-38}$

$$\mathbf{Aspin_d} = \sqrt{1 + Hd} + \delta_d * \sqrt{Hd}$$

1.000000000000000000015014695465362612105706438370938568976294840942396
96734084911269818286

6.- Position of equilibrium radius (R_{i1} in m) and total average acceleration (a_i in m/s²) of the surface of the tons *i* (see equations 47 and 40 of [1]):

Antiproton (ABC), tons A, B, C,

Negaton A

Position of equilibrium radius

$$R_{A1} = \frac{\hbar}{m_A * c} * \sqrt{\frac{\Lambda}{2 * \tau_A}} * Aspin_A$$

$$4.955286951014559676869801745251251549483880208331258230661386244460 31 \times 10^{-16}$$

Total average acceleration

$$a_A = \frac{k * e^2}{\delta_A * m_A * R_{A1}{}^2}$$

$$-1.6851867862605902601919362381368965699175987393782205681508008044467 1 \times 10^{30}$$

Positon B

$$R_{B1} = \frac{\hbar}{m_B * c} * \sqrt{\frac{\Lambda}{2 * \tau_B}} * Aspin_B$$

$$4.955286951014559679841790079215575481697254673856114712395982432232 49 \times 10^{-16}$$

$$a_B = \frac{k * e^2}{\delta_B * m_B * R_{B1}{}^2}$$

$$1.685186786260590258170517289516018088983884467731382590382152728280 53 \times 10^{30}$$

Negaton C

$$R_{C1} = \frac{\hbar}{m_C * c} * \sqrt{\frac{\Lambda}{2 * \tau_C}} * Aspin_C$$

$$4.955286951014559676869801745251251549483880208331258230661386244460 31 \times 10^{-16}$$

$$a_C = \frac{k * e^2}{\delta_C * m_C * R_{C1}{}^2}$$

$$-1.6851867862605902601919362381368965699175987393782205681508008044467 1 \times 10^{30}$$

Antineutron (abcd), tons a, b, c, d,

Negaton a

$$R_{a1} = \frac{\hbar}{m_a * c} * \sqrt{\frac{\Lambda}{2 * \tau_a}} * Aspin_a$$

$$4.9484658893355533436689720431116158377347637651768354423104707270666 2 \times 10^{-16}$$

$$a_a = \frac{k * e^2}{\delta_a * m_a * {R_{a1}}^2}$$

$$-1.6875096805205067184390663683790590417526771011950942972950221505287 2 \times 10^{30}$$

Positon b

$$R_{b1} = \frac{\hbar}{m_b * c} * \sqrt{\frac{\Lambda}{2 * \tau_b}} * Aspin_b$$

$$9.8969317786711066917959265871697175734549129804328202150126443398263 1 \times 10^{-16}$$

$$a_b = \frac{k * e^2}{\delta_b * m_b * {R_{b1}}^2}$$

$$8.4375484026025335845940986575352664617071560438411087625667707112011 \times 10^{29}$$

Negaton c

$$R_{c1} = \frac{\hbar}{m_c * c} * \sqrt{\frac{\Lambda}{2 * \tau_c}} * Aspin_c$$

$$4.9484658893355533436689720431116158377347637651768354423104707270666 2 \times 10^{-16}$$

$$a_c = \frac{k * e^2}{\delta_c * m_c * {R_{c1}}^2}$$

$$-1.6875096805205067184390663683790590417526771011950942972950221505287 2 \times 10^{30}$$

Positon d

$$R_{d1} = \frac{\hbar}{m_d * c} * \sqrt{\frac{\Lambda}{2 * \tau_d}} * Aspin_d$$

$9.8969317786711066917959265871697175734549129804328202150126443398263 1 \times 10^{-16}$

$$a_d = \frac{k * e^2}{\delta_d * m_d * {R_{d1}}^2}$$

$8.4375484026025335845940986575352664617071560438411087625667707112011 \times 10^{29}$

7.- The self-propulsion forces fij among tons separated s=1 m

7.1 - Forces fij between the tons of two antiprotons

Repulsive force (in N) that the negaton **A** exercises over the other negaton **A**

$$f_{AA} = \delta_A * \sqrt{\frac{\tau_A}{\tau_A}} * m_A * a_A * \frac{R_{A1} * R_{A1}}{s^2}$$

$2.307077551085718971829849799034823840000000000000000000000000000000000 \times 10^{-28}$

$$f_{AA} \Big/ \left(\delta_A * \delta_A * \frac{Aspin_A}{Aspin_A} * F_E\right)$$

$1.000000000000000000000000000000000000000000000000000000000000000000000$

$$f_{AA} = \delta_A * \delta_A * \frac{Aspin_A}{Aspin_A} * F_E$$

$2.307077551085718971829849799034823840000000000000000000000000000000000 \times 10^{-28}$

$$f_{AA} \,/\, F_E$$

$1.000000000000000000000000000000000000000000000000000000000000000000000$

Attractive force (in N) that the negaton **A** exercises over the positon **B**

$$f_{AB} = \delta_A * \sqrt{\frac{\tau_A}{\tau_B}} * m_A * a_B * \frac{R_{A1} * R_{B1}}{s^2}$$

$$-2.3070775510857189704461544378663052660042902673484403204516593201950 9 \times 10^{-28}$$

$$f_{AB} \Big/ \left(\delta_A * \delta_B * \frac{Aspin_A}{Aspin_B} * F_E \right)$$

1.0000000000000000000000000000000000000000000000000000000000000000000

$$f_{AB} \,/\, -F_E$$

0.99999999999999999400238903751914809611105143027458902811545222377557

Repulsive force (in N) that the negaton **A** exercises over the negaton **C**

$$f_{AC} = \delta_A * \sqrt{\frac{\tau_A}{\tau_C}} * m_A * a_C * \frac{R_{A1} * R_{C1}}{s^2}$$

$$2.3070775510857189718298497990348238400000000000000000000000000000000 \times 10^{-28}$$

$$f_{AC} \Big/ \left(\delta_A * \delta_C * \frac{Aspin_A}{Aspin_C} * F_E \right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{AC} \,/\, F_E$$

1.00000000000000000000000000000000000000000000000000000000000000000000

Attractive force (in N) that the positon **B** exercises over the negaton **A**

$$f_{BA} = \delta_B * \sqrt{\frac{\tau_B}{\tau_A}} * m_B * a_A * \frac{R_{B1} * R_{A1}}{s^2}$$

$$-2.3070775510857189732135451602033424148255963793393805477978209353604 7 \times 10^{-28}$$

$$f_{BA} \Big/ \left(\delta_B * \delta_A * \frac{Aspin_B}{Aspin_A} * F_E \right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{BA} \,/\, -F_E$$

1.0000000000000000059976109624808519074860822954524600484376761727527

Repulsive force (in N) that the positon **B** exercises over the other positon **B**

$$f_{BB} = \delta_B * \sqrt{\frac{\tau_B}{\tau_B}} * m_B * a_B * \frac{R_{B1} * R_{B1}}{s^2}$$

$2.3070775510857189718298497990348238400000000000000000000000000000000 \times 10^{-28}$

$$f_{BB} \Big/ \left(\delta_B * \delta_B * \frac{Aspin_B}{Aspin_B} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

f_{BB} / F_E

$1.0000000000000000000000000000000000000000000000000000000000000000000$

Attractive force (in N) that the positon **B** exercises over the negaton **C**

$$f_{BC} = \delta_B * \sqrt{\frac{\tau_B}{\tau_C}} * m_B * a_C * \frac{R_{B1} * R_{C1}}{s^2}$$

$-2.30707755108571897321354516020334241482559637933938054779782093536047 \times 10^{-28}$

$$f_{BC} = \delta_B * \delta_C * \frac{Aspin_B}{Aspin_C} * F_E$$

$-2.30707755108571897321354516020334241482559637933938054779782093536047 \times 10^{-28}$

$$f_{BC} \Big/ -\left(\delta_B * \delta_C * \frac{Aspin_B}{Aspin_C} * F_E\right)$$

$-1.0000000000000000000000000000000000000000000000000000000000000000000$

$f_{BC} / -F_E$

$1.0000000000000000059976109624808519074860822954524600484376761727527$

Repulsive force (in N) that the negaton **C** exercises over the negaton **A**

$$f_{CA} = \delta_C * \sqrt{\frac{\tau_C}{\tau_A}} * m_C * a_A * \frac{R_{C1} * R_{A1}}{s^2}$$

$$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$$

$$f_{CA} \Big/ \left(\delta_C * \delta_A * \frac{Aspin_C}{Aspin_A} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{CA} / F_E$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

Attractive force (in N) that the negaton **C** exercises over the position **B**

$$f_{CB} = \delta_C * \sqrt{\frac{\tau_C}{\tau_B}} * m_C * a_B * \frac{R_{C1} * R_{B1}}{s^2}$$

$$-2.30707755108571897044615443786630526600429026734844032045165932019509 \times 10^{-28}$$

$$f_{CB} \Big/ \left(\delta_C * \delta_B * \frac{Aspin_C}{Aspin_B} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{CB} / -F_E$$

$$0.999999999999999999400238903751914809611105143027458902811545222377557$$

Repulsive force (in N) that the negaton **C** exercises over the other negaton **C**

$$f_{CC} = \delta_C * \sqrt{\frac{\tau_C}{\tau_C}} * m_C * a_C * \frac{R_{C1} * R_{C1}}{s^2}$$

$$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$$

$$f_{CC} \Big/ \left(\delta_C * \delta_C * \frac{Aspin_C}{Aspin_C} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{CC} / F_E$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

7.2 - Forces fij between the tons of two neutrons

Repulsive force (in N) that the negaton ***a*** exercises over the other negaton ***a***

$$f_{aa} = \delta_a * \frac{m_a * a_a * {R_{a1}}^2}{s^2}$$

$2.3070775510857189718298497990348238400000000000000000000000000000000 \times 10^{-28}$

f_{aa} / F_E

$1.00000000000000000000000000000000000000000000000000000000000000000000$

Attractive force (in N) that the negaton **a** exercises over the positon **b**

$$f_{ab} = \delta_a * \sqrt{\frac{\tau_a}{\tau_b}} * m_a * a_b * \frac{R_{a1} * R_{b1}}{s^2}$$

$-2.30707755108571897079064779369902509866930540590729520141152648628371 \times 10^{-28}$

$$f_{ab} \Big/ \left(\delta_a * \delta_b \frac{Aspin_a}{Aspin_b} * F_E \right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$f_{ab} / -F_E$

$0.999999999999999999549559136039121636964071496822391282822694774803829$

Repulsive force (in N) that the negaton **a** exercises over the negaton **c**

$$f_{ac} = \delta_a * \sqrt{\frac{\tau_a}{\tau_c}} * m_a * a_c * \frac{R_{a1} * R_{c1}}{s^2}$$

$2.3070775510857189718298497990348238400000000000000000000000000000000 \times 10^{-28}$

$$f_{ac} \Big/ \left(\delta_a * \delta_c \frac{Aspin_a}{Aspin_c} * F_E \right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$f_{ac} / -F_E$

$-1.00000000000000000000000000000000000000000000000000000000000000000000$

Attractive force (in N) that the negaton **a** exercises over the position **d**

$$f_{ad} = \delta_a * \sqrt{\frac{\tau_a}{\tau_d}} * m_a * a_d * \frac{R_{a1} * R_{d1}}{s^2}$$

$-2.30707755108571897079064779369902509866930540590729520141152648628371 \times 10^{-28}$

$$f_{ad} \Big/ \left(\delta_a * \delta_d \frac{Aspin_a}{Aspin_d} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{ad} \,/\, -F_E$$

0.99999999999999999995495591360391216369640714968223912828226947748038 29

Attractive force (in N) that the positon **b** exercises over the negaton **a**

$$f_{ba} = \delta_b * \sqrt{\frac{\tau_b}{\tau_a}} * m_b * a_a * \frac{R_{b1} * R_{a1}}{s^2}$$

$-2.30707755108571897286905180437062258179879364320603931038935282758890 \times 10^{-28}$

$$f_{ba} \Big/ \left(\delta_b * \delta_a * \frac{Aspin_b}{Aspin_a} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{ba} \,/\, -F_E$$

1.00000000000000000045044086396087836323882547510343124535984741103133

Repulsive force (in N) that the positon **b** exercises over the other positon **b**

$$f_{bb} = \delta_b * \frac{m_b * a_b * {R_{b1}}^2}{s^2}$$

$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$

$$f_{bb} \,/\, F_E$$

1.00000000000000000000000000000000000000000000000000000000000000000000

Attractive force (in N) that the positon **b** exercises over the negaton **c**

$$f_{bc} = \delta_b * \sqrt{\frac{\tau_b}{\tau_c}} * m_b * a_c * \frac{R_{b1} * R_{c1}}{s^2}$$

$$-2.30707755108571897286905180437062258179879364320603931038935282758890 \times 10^{-28}$$

$$f_{bc} \Big/ \left(\delta_b * \delta_c * \frac{Aspin_b}{Aspin_c} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{bc} \,/\, -F_E$$

$$1.00000000000000000045044086396087836323882547510343124535984741103133$$

Repulsive force (in N) that the positon **b** exercises over the positon **d**

$$f_{bd} = \delta_b * \sqrt{\frac{\tau_b}{\tau_d}} * m_b * a_d * \frac{R_{b1} * R_{d1}}{s^2}$$

$$2.307077551085718971829849799034823840000000000000000000000000000000 \times 10^{-28}$$

$$f_{bd} \Big/ \left(\delta_b * \delta_d * \frac{Aspin_b}{Aspin_d} * F_E\right)$$

$$1.000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{bd} \,/\, -F_E$$

$$-1.000000000000000000000000000000000000000000000000000000000000000000$$

Repulsive force (in N) that the negaton **c** exercises over the negaton **a**

$$f_{ca} = \delta_c * \sqrt{\frac{\tau_c}{\tau_a}} * m_c * a_a * \frac{R_{c1} * R_{a1}}{s^2}$$

$$2.307077551085718971829849799034823840000000000000000000000000000000 \times 10^{-28}$$

$$f_{ca} \Big/ \left(\delta_c * \delta_a * \frac{Aspin_c}{Aspin_a} * F_E\right)$$

$$1.000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{ca} \,/\, F_E$$

$$1.000000000000000000000000000000000000000000000000000000000000000000$$

Attractive force (in N) that the negaton **c** exercises over the positon **b**

$$f_{cb} = \delta_c * \sqrt{\frac{\tau_c}{\tau_b}} * m_c * a_b * \frac{R_{c1} * R_{b1}}{s^2}$$

$-2.30707755108571897079064779369902509866930540590729520141152648628371 \times 10^{-28}$

$$f_{cb} \Big/ \left(\delta_c * \delta_b * \frac{Aspin_c}{Aspin_b} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{cb} \,/\, -F_E$$

0.999999999999999999549559136039121636964071496822391282822694774803829

Repulsive force (in N) that the negaton **c** exercises over the other negaton **c**

$$f_{cc} = \delta_c * \sqrt{\frac{\tau_c}{\tau_c}} * m_c * a_c * \frac{R_{c1} * R_{c1}}{s^2}$$

$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$

$$f_{cc} \Big/ \left(\delta_c * \delta_c * \frac{Aspin_c}{Aspin_c} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{cc} \,/\, F_E$$

1.000000000000000000000000000000000000000000000000000000000000000000

Attractive force (in N) that the negaton **c** exercises over the positon **d**

$$f_{cd} = \delta_c * \sqrt{\frac{\tau_c}{\tau_d}} * m_c * a_d * \frac{R_{c1} * R_{d1}}{s^2}$$

$-2.30707755108571897079064779369902509866930540590729520141152648628371 \times 10^{-28}$

$$f_{cd} \Big/ \left(\delta_c * \delta_d * \frac{Aspin_c}{Aspin_d} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{cd} \,/\, -F_E$$

0.999999999999999999549559136039121636964071496822391282822694774803829

Attractive force (in N) that the positon **d** exercises over the negaton **a**

$$f_{da} = \delta_d * \sqrt{\frac{\tau_d}{\tau_a}} * m_d * a_a * \frac{R_{d1} * R_{a1}}{s^2}$$

$$-2.30707755108571897286905180437062258179879364320603931038935282758890 \times 10^{-28}$$

$$f_{da} \Big/ \left(\delta_d * \delta_a * \frac{Aspin_d}{Aspin_a} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{da} = \delta_d * \delta_a * \frac{Aspin_d}{Aspin_a} * F_E$$

$$-2.30707755108571897286905180437062258179879364320603931038935282758890 \times 10^{-28}$$

$$f_{da} / F_E$$

$$-1.00000000000000000045044086396087836323882547510343124535984741103133$$

Repulsive force (in N) that the positon **d** exercises over the positon **b**

$$f_{db} = \delta_d * \sqrt{\frac{\tau_d}{\tau_b}} * m_d * a_b * \frac{R_{d1} * R_{b1}}{s^2}$$

$$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$$

$$f_{db} \Big/ \left(\delta_d * \delta_b * \frac{Aspin_d}{Aspin_b} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{db} / -F_E$$

$$-1.00000000000000000000000000000000000000000000000000000000000000000000$$

Attractive force (in N) that the positon **d** exercises over the negaton **c**

$$f_{dc} = \delta_d * \sqrt{\frac{\tau_d}{\tau_c}} * m_d * a_c * \frac{R_{d1} * R_{c1}}{s^2}$$

$-2.30707755108571897286905180437062258179879364320603931038935282758890 \times 10^{-28}$

$$f_{dc} \Big/ \left(\delta_d * \delta_c * \frac{Aspin_d}{Aspin_c} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{dc} \,/\, F_E$$

$-1.00000000000000000045044086396087836323882547510343124535984741103133$

Repulsive force (in N) that the positon **d** exercises over the other positon **d**

$$f_{dd} = \delta_d * \sqrt{\frac{\tau_d}{\tau_d}} * m_d * a_d * \frac{R_{d1} * R_{d1}}{s^2}$$

$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$

$$f_{dd} \Big/ \left(\delta_d * \delta_d * \frac{Aspin_d}{Aspin_d} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{dd} \,/\, -F_E$$

$-1.00000000000000000000000000000000000000000000000000000000000000000000$

7.3 - Forces fij among the tons of the proton and the neutron

Repulsive force (in N) that the negaton **A** exercises over the negaton **a**

$$f_{Aa} = \delta_A * \sqrt{\frac{\tau_A}{\tau_a}} * m_A * a_a * \frac{R_{A1} * R_{a1}}{s^2}$$

$2.30707755108571897183080345534109704717116974820409588105530050525711 \times 10^{-28}$

$$f_{Aa} \Big/ \left(\delta_A * \delta_a * \frac{Aspin_A}{Aspin_a} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{Aa} \,/\, -F_E$$

$-1.00000000000000000000041336118320964680720897323130043758395411873248$

Attractive force (in N) that the negaton **A** exercises over the positon **b**

$$f_{Ab} = \delta_A * \sqrt{\frac{\tau_A}{\tau_b}} * m_A * a_b * \frac{R_{A1} * R_{b1}}{s^2}$$

$$-2.30707755108571897079160145000529830584004558834087163900439681205925 \times 10^{-28}$$

$$f_{Ab} \Big/ \left(\delta_A * \delta_b * \frac{Aspin_A}{Aspin_b} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{Ab} \,/ -F_E$$

0.999999999999999999549972497222331283771094275285198876171819409054158

Repulsive force (in N) that the negaton **A** exercises over the negaton **c**

$$f_{Ac} = \delta_A * \sqrt{\frac{\tau_A}{\tau_c}} * m_A * a_c * \frac{R_{A1} * R_{c1}}{s^2}$$

$$2.30707755108571897183080345534109704717116974820409588105530050525711 \times 10^{-28}$$

$$f_{Ac} \Big/ \left(\delta_A * \delta_c * \frac{Aspin_A}{Aspin_c} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{Ac} \,/\, F_E$$

1.00000000000000000000041336118320964680720897323130043758395411873248

Attractive force (in N) that the negaton **A** exercises over the positon d

$$f_{Ad} = \delta_A * \sqrt{\frac{\tau_A}{\tau_d}} * m_A * a_d * \frac{R_{A1} * R_{d1}}{s^2}$$

$$-2.30707755108571897079160145000529830584004558834087163900439681205925 \times 10^{-28}$$

$$f_{Ad} \Big/ \left(\delta_A * \delta_d * \frac{Aspin_A}{Aspin_d} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{Ad} \,/ -F_E$$

0.999999999999999999549972497222331283771094275285198876171819409054158

Attractive force (in N) that the positon **B** exercises over the negation **a**

$$f_{Ba} = \delta_B * \sqrt{\frac{\tau_B}{\tau_a}} * m_B * a_a * \frac{R_{B1} * R_{a1}}{s^2}$$

$-2.307077551085718973214498816509615621997338093495170747268187670154 51 \times 10^{-28}$

$$f_{Ba} \Big/ \left(\delta_B * \delta_a * \frac{Aspin_B}{Aspin_a} * F_E\right)$$

1.000000000000000000000000000000000000000000000000000000000000000000

$$f_{Ba} = \delta_B * \delta_a * \frac{Aspin_B}{Aspin_a} * F_E$$

$-2.30707755108571897321449881650961562199733809349517074726818767015451 \times 10^{-28}$

$$f_{Ba} / -F_E$$

1.00000000000000000060017445743129483755606512073293466578257092611551

Repulsive force (in N) that the positon **B** exercises over the positon **b**

$$f_{Bb} = \delta_B * \sqrt{\frac{\tau_B}{\tau_b}} * m_B * a_b * \frac{R_{B1} * R_{b1}}{s^2}$$

$2.30707755108571897217529681117381688004294099968853937636104063402581 \times 10^{-28}$

$$f_{Bb} \Big/ \left(\delta_B * \delta_b * \frac{Aspin_B}{Aspin_b} * F_E\right)$$

1.000000000000000000000000000000000000000000000000000000000000000000000

$$f_{Bb} / F_E$$

1.00000000000000000014973359347041647424979351642272208857650777867004

Attractive force (in N) that the positon **B** exercises over the negaton **c**

$$f_{Bc} = \delta_B * \sqrt{\frac{\tau_B}{\tau_c}} * m_B * a_c * \frac{R_{B1} * R_{c1}}{s^2}$$

$-2.30707755108571897321449881650961562199733809349517074726818767015451 \times 10^{-28}$

$$f_{Bc} = \delta_B * \delta_c * \frac{Aspin_B}{Aspin_c} * F_E$$

$-2.30707755108571897321449881650961562199733809349517074726818767015451 \times 10^{-28}$

$$f_{Bc} \Big/ -\left(\delta_B * \delta_c * \frac{Aspin_B}{Aspin_c} * F_E\right)$$

$-1.000000000000000000000000000000000000000000000000000000000000000000$

$$f_{Bc} / -F_E$$

1.00000000000000000060017445743129483755606512073293466578257092611551

Repulsive force (in N) that the positon **B** exercises over the positon **d**

$$f_{Bd} = \delta_B * \sqrt{\frac{\tau_B}{\tau_d}} * m_B * a_d * \frac{R_{B1} * R_{d1}}{s^2}$$

$2.30707755108571897217529681117381688004294099968853937636104063402581 \times 10^{-28}$

$$f_{Bd} \Big/ \left(\delta_B * \delta_d * \frac{Aspin_B}{Aspin_d} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{Bd} \,/\, F_E$$

$1.00000000000000000014973359347041647424979351642272208857650777867004$

Repulsive force (in N) that the negaton **C** exercises over the negaton **a**

$$f_{Ca} = \delta_C * \sqrt{\frac{\tau_C}{\tau_a}} * m_C * a_a * \frac{R_{C1} * R_{a1}}{s^2}$$

$2.30707755108571897183080345534109704717116974820409588105530050525711 \times 10^{-28}$

$$f_{Ca} \Big/ \left(\delta_C * \delta_a * \frac{Aspin_C}{Aspin_a} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{Ca} \,/\, F_E$$

$1.00000000000000000000041336118320964680720897323130043758395411873248$

Attractive force (in N) that the negaton **C** exercises over the positon **b**

$$f_{Cb} = \delta_C * \sqrt{\frac{\tau_C}{\tau_b}} * m_C * a_b * \frac{R_{C1} * R_{b1}}{s^2}$$

$-2.30707755108571897079160145000529830584004558834087163900439681205925 \times 10^{-28}$

$$f_{Cb} \Big/ \left(\delta_C * \delta_b * \frac{Aspin_C}{Aspin_b} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{Cb} \,/\, -F_E$$

$0.99999999999999999549972497222331283771094275285198876171819409054158$

Repulsive force (in N) that the negaton **C** exercises over the negaton **c**

$$f_{Cc} = \delta_C * \sqrt{\frac{\tau_C}{\tau_c}} * m_C * a_c * \frac{R_{C1} * R_{c1}}{s^2}$$

$2.30707755108571897183080345534109704717116974820409588105530050525711 \times 10^{-28}$

$$f_{Cc} \Big/ \left(\delta_C * \delta_c * \frac{Aspin_C}{Aspin_c} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$f_{Cc} \,/\, F_E$

1.0000000000000000000041336118320964680720897323130043758395411873248

Attractive force (in N) that the negaton **C** exercises over the positon **d**

$$f_{Cd} = \delta_C * \sqrt{\frac{\tau_C}{\tau_d}} * m_C * a_d * \frac{R_{C1} * R_{d1}}{s^2}$$

$-2.30707755108571897079160145000529830584004558834087163900439681205925 \times 10^{-28}$

$$f_{Cd} \Big/ \left(\delta_C * \delta_d * \frac{Aspin_C}{Aspin_d} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$f_{Cd} \,/\, -F_E$

0.999999999999999999549972497222331283771094275285198876171819409054158

7.4 - Forces fij among the tons of the neutron and the proton

Repulsive force (in N) that the negaton **a** exercises over the negaton **A**

$$f_{aA} = \delta_a * \sqrt{\frac{\tau_a}{\tau_A}} * m_a * a_A * \frac{R_{a1} * R_{A1}}{s^2}$$

$2.30707755108571897182889614272855063282883064600040325537893675827115 \times 10^{-28}$

$$f_{aA} \Big/ \left(\delta_a * \delta_A * \frac{Aspin_a}{Aspin_A} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{aA} = \delta_a * \delta_A * \frac{Aspin_a}{Aspin_A} * F_E$$

$2.30707755108571897182889614272855063282883064600040325537893675827115 \times 10^{-28}$

$f_{aA} \,/\, F_E$

0.999999999999999999999958663881679035319279119763616734689523940529687 7

Attractive force (in N) that the negaton **a** exercises over the positon **B**

$$f_{aB} = \delta_a * \sqrt{\frac{\tau_a}{\tau_B}} * m_a * a_B * \frac{R_{a1} * R_{B1}}{s^2}$$

$-2.30707755108571897044520078156003205883369287930053789424531902864845 \times 10^{-28}$

$$f_{aB} \Big/ \left(\delta_a * \delta_B * \frac{Aspin_a}{Aspin_B} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{aB} = \delta_a * \delta_B * \frac{Aspin_a}{Aspin_B} * F_E$$

$-2.30707755108571897044520078156003205883369287930053789424531902864845 \times 10^{-28}$

$$f_{aB} / -F_E$$

$0.999999999999999999399825542568705162804144258620014473061485023757235$

Repulsive force (in N) that the negaton **a** exercises over the negaton **C**

$$f_{aC} = \delta_a * \sqrt{\frac{\tau_a}{\tau_C}} * m_a * a_C * \frac{R_{a1} * R_{C1}}{s^2}$$

$2.30707755108571897182889614272855063282883064600040325537893675827115 \times 10^{-28}$

$$f_{aC} \Big/ \left(\delta_a * \delta_C * \frac{Aspin_a}{Aspin_C} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{aC} / F_E$$

$0.999999999999999999999586638816790353192791197636167346895239405296877$

Attractive force (in N) that the positon **b** exercises over the negaton **A**

$$f_{bA} = \delta_b * \sqrt{\frac{\tau_b}{\tau_A}} * m_b * a_A * \frac{R_{b1} * R_{A1}}{s^2}$$

$-2.30707755108571897286809814806434937462719472343592312230566608996749 \times 10^{-28}$

$$f_{bA} \Big/ \left(\delta_b * \delta_A * \frac{Aspin_b}{Aspin_A} * F_E\right)$$

$1.00000000000000000000000000000000000000000000000000000000000000000000$

$$f_{bA} / -F_E$$

$1.00000000000000000045002750277766871643143047797110574802017353907936$

Repulsive force (in N) that the positon **b** exercises over the positon **B**

$$f_{bB} = \delta_b * \sqrt{\frac{\tau_b}{\tau_B}} * m_b * a_B * \frac{R_{b1} * R_{B1}}{s^2}$$

$$2.30707755108571897148440278689583080000878402279265063240938755036358 \times 10^{-28}$$

$$f_{bB} \Big/ \left(\delta_b * \delta_B * \frac{Aspin_b}{Aspin_B} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{bB} / F_E$$

$$0.999999999999999999850266406529583525772626632590841858433053956541782$$

Attractive force (in N) that the positon **b** exercises over the negaton **C**

$$f_{bC} = \delta_b * \sqrt{\frac{\tau_b}{\tau_C}} * m_b * a_C * \frac{R_{b1} * R_{C1}}{s^2}$$

$$-2.30707755108571897286809814806434937462719472343592312230566608996749 \times 10^{-28}$$

$$f_{bC} \Big/ \left(\delta_b * \delta_C * \frac{Aspin_b}{Aspin_C} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{bC} / -F_E$$

$$1.00000000000000000045002750277766871643143047797110574802017353907936$$

Repulsive force (in N) that the negaton **c** exercises over the negaton **A**

$$f_{cA} = \delta_c * \sqrt{\frac{\tau_c}{\tau_A}} * m_c * a_A * \frac{R_{c1} * R_{A1}}{s^2}$$

$$2.30707755108571897182889614272855063282883064600040325537893675827115 \times 10^{-28}$$

$$f_{cA} \Big/ \left(\delta_c * \delta_A * \frac{Aspin_c}{Aspin_A} * F_E\right)$$

$$1.00000000000000000000000000000000000000000000000000000000000000000000$$

$$f_{cA} / F_E$$

$$0.999999999999999999999586638816790353192791197636167346895239405296877$$

Attractive force (in N) that the negaton c exercises over the positon B

$$f_{cB} = \delta_c * \sqrt{\frac{\tau_c}{\tau_B}} * m_c * a_B * \frac{R_{c1} * R_{B1}}{s^2}$$

$-2.307077551085718970445200781560032058833692879300537894245319028648 45 \times 10^{-28}$

$$f_{cB} \Big/ \left(\delta_c * \delta_B * \frac{Aspin_c}{Aspin_B} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{cB} \, / \, -F_E$$

0.999999999999999999399825542568705162804144258620014473061485023757235

Repulsive force (in N) that the negaton c exercises over the negaton C

$$f_{cC} = \delta_c * \sqrt{\frac{\tau_c}{\tau_C}} * m_c * a_C * \frac{R_{c1} * R_{C1}}{s^2}$$

$2.30707755108571897182889614272855063282883064600040325537893675827115 \times 10^{-28}$

$$f_{cC} \Big/ \left(\delta_c * \delta_C * \frac{Aspin_c}{Aspin_C} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{cC} \, / \, F_E$$

0.999999999999999999999586638816790353192791197636167346895239405296877

Attractive force (in N) that the positon d exercises over the negaton A

$$f_{dA} = \delta_d * \sqrt{\frac{\tau_d}{\tau_A}} * m_d * a_A * \frac{R_{d1} * R_{A1}}{s^2}$$

$-2.307077551085718972868098148064349374627194723435923122305666089967 49 \times 10^{-28}$

$$f_{dA} \Big/ \left(\delta_d * \delta_A * \frac{Aspin_d}{Aspin_A} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{dA} \, / \, -F_E$$

1.00000000000000000045002750277766871643143047797110574802017353907936

Repulsive force (in N) that the positon d exercises over the positon B

$$f_{dB} = \delta_d * \sqrt{\frac{\tau_d}{\tau_B}} * m_d * a_B * \frac{R_{d1} * R_{B1}}{s^2}$$

$$2.30707755108571897148440278689583080000878402279265063240938755036358 \times 10^{-28}$$

$$f_{dB} \Big/ \left(\delta_d * \delta_B * \frac{Aspin_d}{Aspin_B} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{dB} / F_E$$

0.999999999999999999850266406529583525772626632590841858433053956541782

Attractive force (in N) that the positon d exercises over the negaton C

$$f_{dC} = \delta_d * \sqrt{\frac{\tau_d}{\tau_C}} * m_d * a_C * \frac{R_{d1} * R_{C1}}{s^2}$$

$$-2.30707755108571897286809814806434937462719472343592312230566608996749 \times 10^{-28}$$

$$f_{dC} \Big/ \left(\delta_d * \delta_C * \frac{Aspin_d}{Aspin_C} * F_E\right)$$

1.00000000000000000000000000000000000000000000000000000000000000000000

$$f_{dC} / -F_E$$

1.00000000000000000045002750277766871643143047797110574802017353907936

8.- Mechanical nuclear forces
8.1 - Distances r (in m) between two tons

i15 = $10^{-15} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-15}$

i14 = $10^{-14} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-14}$

i13 = $10^{-13} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-13}$

i12 = $10^{-12} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-12}$

i11 = $10^{-11} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-11}$

i10 = $10^{-10} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-10}$

i9 = $10^{-9} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-9}$

i8 = $10^{-8} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-8}$

i7 = $10^{-7} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-7}$

i6 = $10^{-6} * \zeta$

1.0000000000000000000000000000000000000000000000000000000000000000000000000000
00 $\times 10^{-6}$

i5 = $10^{-5} * \zeta$

0.0000100000000000000000000000000000000000000000000000000000000000000000000000
0000000

$$i4 = 10^{-4} * \zeta$$

```
0.00010000000000000000000000000000000000000000000000000000000000000000000000000
 000000
```

$$i3 = 10^{-3} * \zeta$$

```
0.00100000000000000000000000000000000000000000000000000000000000000000000000000
 00000
```

$$i2 = 10^{-2} * \zeta$$

```
0.01000000000000000000000000000000000000000000000000000000000000000000000000000
 0000
```

$$i1 = 10^{-1} * \zeta$$

```
0.10000000000000000000000000000000000000000000000000000000000000000000000000000
 000
```

$$i0 = 1 * \zeta$$

```
1.00000000000000000000000000000000000000000000000000000000000000000000000000000
 00
```

```
Clear[r]
```

8.2 - Verification of the force of gravity between two antineutrons for all distances r.

$$\Sigma FijGnn[r\_] := \frac{f_{aa}}{r^2 - R_{a1}{}^2} + \frac{f_{ab}}{r^2 - R_{b1}{}^2} + \frac{f_{ac}}{r^2 - R_{c1}{}^2} + \frac{f_{ad}}{r^2 - R_{d1}{}^2} + \frac{f_{ba}}{r^2 - R_{a1}{}^2} + \frac{f_{bb}}{r^2 - R_{b1}{}^2} + \frac{f_{bc}}{r^2 - R_{c1}{}^2} + \frac{f_{bd}}{r^2 - R_{d1}{}^2} + \frac{f_{ca}}{r^2 - R_{a1}{}^2} + \frac{f_{cb}}{r^2 - R_{b1}{}^2} + \frac{f_{cc}}{r^2 - R_{c1}{}^2} + \frac{f_{cd}}{r^2 - R_{d1}{}^2} + \frac{f_{da}}{r^2 - R_{a1}{}^2} + \frac{f_{db}}{r^2 - R_{b1}{}^2} + \frac{f_{dc}}{r^2 - R_{c1}{}^2} + \frac{f_{dd}}{r^2 - R_{d1}{}^2}$$

$$FGnn[r\_] := -G * \frac{mn^2}{r^2}$$

```
ΣFijGnn[i15]
```

$$1.971930376398398845458786705357391244588372467951 \times 10^{-14}$$

```
FGnn[i15]

-1.87239619645333804720351725549044616481142717567000000000000000000000
  00 × 10^-34

ΣFijGnn[i15]
------------
 FGnn[i15]

-1.0531587172274739705760021897989140007415897409 04 × 10^20
```

As we can observe, for a distance **r** of 1 fermi (i15) the sum of all the self-propulsion forces between the tons of two antineutrons **ΣFijGnn(r)** leads us to an **repulsive nuclear force** 10^{20} times greater than the force of the gravity **FGnn(r)**.

```
ΣFijGnn[i14]

3.0914484665764235318601957166434304625040267064 × 10^-20

FGnn[i14]

-1.87239619645333804720351725549044616481142717567000000000000000000000
  00 × 10^-36

ΣFijGnn[i14]
------------
 FGnn[i14]

-1.6510653420639254459815878192247131848042716694 4 × 10^16
```

```
ΣFijGnn[i13]

3.0540458993249797896962313083348515913503041 8 × 10^-24
```

FGnn[i13]

$-1.87239619645333804720351725549044616481142717567000000000000000000000\backslash$
00×10^{-38}

$$\frac{\textbf{ΣFijGnn[i13]}}{\textbf{FGnn[i13]}}$$

$-1.6310895659315603688946957907193036973608491 44 \times 10^{14}$

ΣFijGnn[i12]

$3.0536757185488932023882533410171569929912416 \times 10^{-28}$

FGnn[i12]

$-1.87239619645333804720351725549044616481142717567000000000000000000000\backslash$
00×10^{-40}

$$\frac{\textbf{ΣFijGnn[i12]}}{\textbf{FGnn[i12]}}$$

$-1.6308918616332992542756183805214151129292264 \times 10^{12}$

ΣFijGnn[i11]

$3.0536720169364629371352299426112002810459 \times 10^{-32}$

FGnn[i11]

$-1.87239619645333804720351725549044616481142717567000000000000000000000\backslash$
00×10^{-42}

$$\frac{\textbf{ΣFijGnn[i11]}}{\textbf{FGnn[i11]}}$$

$-1.6308898846946378337994622812852897755 3295 \times 10^{10}$

ΣFijGnn[i6]

$1.1812757832822508138657344221 01 \times 10^{-52}$

ΣFijGnn[i5]

$-1.84185947665598215862983897089 6 \times 10^{-54}$

As we can observe, the sum of all the selfpropulsion forces between the tons of two antineutrons **ΣFijGnn(r)** is always a **repulsive nuclear force** up to a distance r of 1 micron (i6). Beyond this distance, the antineutrons attract each other with a force practically equal to gravity **FGnn(r)**.

- -

ΣFijGnn[i5]

$-1.84185947665598215862983897089 6 \times 10^{-54}$

FGnn[i5]

$-1.87239619645333804720351725549044616481142717567000000000000000000000 00 \times 10^{-54}$

$$\frac{\text{ΣFijGnn[i5]}}{\text{FGnn[i5]}}$$

0.98369110135173419017754008503 69

ΣFijGnn[i2]

$-1.87239616591661824984762868218 6 \times 10^{-60}$

FGnn[i2]

$-1.87239619645333804720351725549044616481142717567000000000000000000000 00 \times 10^{-60}$

$$\frac{\text{ΣFijGnn[i2]}}{\text{FGnn[i2]}}$$

0.9999998369110135173419017773 98

```
ΣFijGnn[i1]

-1.87239619614797084922995836975 × 10^-62

FGnn[i1]

-1.872396196453338047203517255490446164811427175670000000000000000000
  00 × 10^-62
```

$$\frac{\text{ΣFijGnn[i1]}}{\text{FGnn[i1]}}$$

```
0.9999999998369110135173419017774
```

```
ΣFijGnn[i0]

-1.8723961964502843752237816666633 × 10^-64

FGnn[i0]

-1.872396196453338047203517255490446164811427175670000000000000000000
  00 × 10^-64
```

$$\frac{\text{ΣFijGnn[i0]}}{\text{FGnn[i0]}}$$

```
0.9999999999998369110135173419 0178
```

8.3 - Verification of the electric force between two antiprotons for all distances r.

$$\text{ΣFijEpp[r\_]} := \frac{f_{AA}}{r^2 - R_{A1}{}^2} + \frac{f_{AB}}{r^2 - R_{B1}{}^2} + \frac{f_{AC}}{r^2 - R_{C1}{}^2} + \frac{f_{BA}}{r^2 - R_{A1}{}^2} + \frac{f_{BB}}{r^2 - R_{B1}{}^2} + \frac{f_{BC}}{r^2 - R_{C1}{}^2} + \frac{f_{CA}}{r^2 - R_{A1}{}^2} + \frac{f_{CB}}{r^2 - R_{B1}{}^2} + \frac{f_{CC}}{r^2 - R_{C1}{}^2}$$

$$\text{FEpp}[r\_] := k * \frac{e^2}{r^2}$$

ΣFijEpp[i15]

305.79541891941046428002527590278175371814274751198723866822598958184

FEpp[i15]

230.70775510857189718298497990348238400000000000000000000000000000000

$$\frac{\text{ΣFijEpp[i15]}}{\text{FEpp[i15]}}$$

1.3254665790298295050468320478727090355130809901363097198808071604084

ΣFijEpp[i14]

2.3127564943064669553405214489810177859978679695794285781451918467375

FEpp[i14]

2.3070775510857189718298497990348238400000000000000000000000000000000

$$\frac{\text{ΣFijEpp[i14]}}{\text{FEpp[i14]}}$$

1.0024615311340858275261032387671279519737863330987400522519618176511

As we can observe, the sum of all the selfpropulsion forces between the tons of two antiprotons **ΣFijEpp(r)** is **a repulsive force** and is practically equal to the electric force **FEpp(r)** for all distances **r**. Conclusion: there are no nuclear forces between antiprotons.

ΣFijEpp[i13]

0.023071342024632880732223405258177610275425705571509626560887495655560

FEpp[i13]

0.02307077551085718971829849799034823840000000000000000000000000000000
00

$\dfrac{\texttt{ΣFijEpp[i13]}}{\texttt{FEpp[i13]}}$

1.0000245554717232808454915307694582450673447887208228195795437836115

ΣFijEpp[i1]

$2.3070775510857189718298497990914738248421864260016184887566567854483 \times 10^{-26}$

FEpp[i1]

$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-26}$

$\dfrac{\texttt{ΣFijEpp[i1]}}{\texttt{FEpp[i1]}}$

1.0000000000000000000000000000245548680474684259797436968828470900212

ΣFijEpp[i0]

$2.3070775510857189718298497990353903382052463038181308657535818906279 \times 10^{-28}$

FEpp[i0]

$2.30707755108571897182984979903482384000000000000000000000000000000000 \times 10^{-28}$

$$\frac{\Sigma\text{FijEpp}[\text{i0}]}{\text{FEpp}[\text{i0}]}$$

1.000000000000000000000000000000245547968242206565841719811303079266 0

8.4 - Verification of the nuclear force between an antineutron and an antiproton for all distances r

$$\Sigma\text{Fijnp}[r\_] := \frac{f_{aA}}{r^2 - R_{A1}{}^2} + \frac{f_{aB}}{r^2 - R_{B1}{}^2} + \frac{f_{aC}}{r^2 - R_{C1}{}^2} + \frac{f_{bA}}{r^2 - R_{A1}{}^2} + \frac{f_{bB}}{r^2 - R_{B1}{}^2} + \frac{f_{bC}}{r^2 - R_{C1}{}^2} + \frac{f_{cA}}{r^2 - R_{A1}{}^2} + \frac{f_{cB}}{r^2 - R_{B1}{}^2} + \frac{f_{cC}}{r^2 - R_{C1}{}^2} + \frac{f_{dA}}{r^2 - R_{A1}{}^2} + \frac{f_{dB}}{r^2 - R_{B1}{}^2} + \frac{f_{dC}}{r^2 - R_{C1}{}^2}$$

$$\text{FYannoe}[r\_] := -e * \frac{mn}{r^2} * \sqrt{G * k}$$

$\Sigma\text{Fijnp}[\text{i15}]$

$-2.7548550538667595736259031567631434585294604468 20 \times 10^{-16}$

$\text{FYannoe}[\text{i15}]$

$-2.078404010671597483129488237298744108930970576838104078232092725345 84 \times 10^{-16}$

$$\frac{\Sigma\text{Fijnp}[\text{i15}]}{\text{FYannoe}[\text{i15}]}$$

1.325466579029829506139769595423159343698856010349 5

$$\frac{\Sigma\text{Fijnp}[\text{i15}]}{\text{FEpp}[\text{i15}]}$$

$-1.194088622018932524679885854091504121180756517680 9 \times 10^{-18}$

$\Sigma\text{Fijnp}[\text{i14}]$

$-2.083520066853074474576210827553613322189385135673 7 \times 10^{-18}$

FYannoe[i14]

$-2.0784040106715974831294882372987441089309705768381040782320927253458 4 \times 10^{-18}$

$$\frac{\textbf{ΣFijnp[i14]}}{\textbf{FYannoe[i14]}}$$

1.0024615311340858283527011060278008036336944992883

$$\frac{\textbf{ΣFijnp[i14]}}{\textbf{FEpp[i14]}}$$

$-9.030992763431651687671392514113117266061055102301 \times 10^{-19}$

As we can observe, the sum of all the selfpropulsion forces between the tons of an antineutron and an anti**p**roton **ΣFijnp(r)** is an attractive force and lead us to obtain the attractive Yannoe force **FYannoe(r)** for all distances **r** and, they are 10^{18} times smaller than the electrical forces **FEpp(r)**.

ΣFijnp[i13]

$-2.0784550468625110847559483062816127075295541838945 \times 10^{-20}$

FYannoe[i13]

$-2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-20}$

$$\frac{\textbf{ΣFijnp[i13]}}{\textbf{FYannoe[i13]}}$$

1.0000245554717232816700799454750827698368943968702

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i13}]}{\mathrm{FEpp}[\mathrm{i13}]}$$

$$-9.009038494975527301030308281924316055977404454159 \times 10^{-19}$$

ΣFijnp[i12]

$$-2.078404521021100066790555728783208588380437989128\,5 \times 10^{-22}$$

FYannoe[i12]

$$-2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-22}$$

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i12}]}{\mathrm{FYannoe}[\mathrm{i12}]}$$

1.000000245548747963949100720460599549511690768213 1

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i12}]}{\mathrm{FEpp}[\mathrm{i12}]}$$

$$-9.008819491321370810611636395409135958957874362934 \times 10^{-19}$$

ΣFijnp[i6]

$$-2.0784040106715974853536234000241506617106832430955 \times 10^{-34}$$

ΣFijnp[i5]

$$-2.0784040106715974848483775165305169580808586883161 \times 10^{-36}$$

ΣFijnp[i2]

$$-2.0784040106715974848432740278613477640417469854210 \times 10^{-42}$$

FYannoe[i2]

$$-2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-42}$$

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i2}]}{\mathrm{FYannoe}[\mathrm{i2}]}$$

1.000000000000000008245681695008016019971732095522

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i2}]}{\mathrm{FEpp}[\mathrm{i2}]}$$

$-9.00881727921756727017592375610202094117848435371 7\times 10^{-19}$

ΣFijnp[i1]

$-2.078404010671597484843274022808888929105409950375 8\times 10^{-44}$

FYannoe[i1]

$-2.0784040106715974831294882372987441089309705768381040782320927253458 4\times 10^{-44}$

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i1}]}{\mathrm{FYannoe}[\mathrm{i1}]}$$

1.000000000000000008245681670698695940745512661575

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i1}]}{\mathrm{FEpp}[\mathrm{i1}]}$$

$-9.00881727921756727017592373420219866360211167218 9\times 10^{-19}$

ΣFijnp[i0]

$-2.078404010671597484843274022758364340756046580025 3\times 10^{-46}$

FYannoe[i0]

$-2.0784040106715974831294882372987441089309705768381040782320927253458 4\times 10^{-46}$

$$\frac{\Sigma\mathrm{Fijnp}[\mathrm{i0}]}{\mathrm{FYannoe}[\mathrm{i0}]}$$

1.000000000000000008245681670455602739953250467236

$$\frac{\Sigma\text{Fijnp}[\text{i0}]}{\text{FEpp}[\text{i0}]}$$

$-9.008817279217567270175923733983200440826347945374 \times 10^{-19}$

8.5 - Verification of the nuclear force between an antiproton and an antineutron for all distances r.

$$\Sigma\text{Fijpn}[r\_] := \frac{f_{Aa}}{r^2 - R_{a1}{}^2} + \frac{f_{Ab}}{r^2 - R_{b1}{}^2} + \frac{f_{Ac}}{r^2 - R_{c1}{}^2} + \frac{f_{Ad}}{r^2 - R_{d1}{}^2} + \frac{f_{Ba}}{r^2 - R_{a1}{}^2} + \frac{f_{Bb}}{r^2 - R_{b1}{}^2} + \frac{f_{Bc}}{r^2 - R_{c1}{}^2} + \frac{f_{Bd}}{r^2 - R_{d1}{}^2} + \frac{f_{Ca}}{r^2 - R_{a1}{}^2} + \frac{f_{Cb}}{r^2 - R_{b1}{}^2} + \frac{f_{Cc}}{r^2 - R_{c1}{}^2} + \frac{f_{Cd}}{r^2 - R_{d1}{}^2}$$

$\Sigma\text{Fijpn}[\text{i15}]$

$-21\,888.893017593367246367484446065001014298397247679741152944164 18671$

$$\frac{\Sigma\text{Fijpn}[\text{i15}]}{\text{FEpp}[\text{i15}]}$$

$-94.877144495174753311704505788099164615214598472336706040518869 9974$

As we can observe, for a distance **r** of 1 fermi (i15), we obtain an **attractive nuclear force** 94,87 times greater than the electric force **FEpp(r)**.

$\Sigma\text{Fijpn}[\text{i14}]$

$-0.034315808288265356486520580909802531039658878902249951595257 2499902$

$$\frac{\Sigma\text{Fijpn}[\text{i14}]}{\text{FEpp}[\text{i14}]}$$

$-0.014874145982702754835152140887832470369250837276984001207272 0048904$

ΣFijpn[i13]

$-3.390063095596750100710882293038024405796737099825911078017340104 \times 10^{-6}$

$\frac{\textbf{ΣFijpn[i13]}}{\textbf{FEpp[i13]}}$

$-0.0001469418786551572246276959242510174267695020484895423259388649363$

ΣFijpn[i12]

$-3.3896521861903171863507449577623668354672540141025096451390491 \times 10^{-10}$

$\frac{\textbf{ΣFijpn[i12]}}{\textbf{FEpp[i12]}}$

$-1.4692406783617372149753910878611789854177790825035574510466244 \times 10^{-6}$

ΣFijpn[i6]

$-1.3112440253476279164666994983843979728595297134248 \times 10^{-34}$

ΣFijpn[i5]

$2.0445075303114052274779651044660033671344034547669 \times 10^{-36}$

As we can observe, the sum of all the selfpropulsive forces between the tons of an anti**p**roton and an anti**n**eutron **ΣFijpn(r)** is always an **attractive nuclear force** up to a distance **r** of 1 micron (i6). Beyond this distance, the antiproton repels the antineutron with the Yannoe force **-FYannoe(r)**.

- -

- -

- -

- -

ΣFijpn[i5]

$2.0445075303114052274779651044660033671344034547669 \times 10^{-36}$

-FYannoe[i5]

$2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-36}$

$\frac{\textbf{ΣFijpn[i5]}}{\textbf{-FYannoe[i5]}}$

0.9836911013517341893664197166565196446556032929579

ΣFijpn[i2]

$2.0784039767751171212234485145173033279295456283022 \times 10^{-42}$

-FYannoe[i2]

$2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-42}$

$$\frac{\Sigma\mathrm{Fijpn}[\mathrm{i2}]}{-\mathrm{FYannoe}[\mathrm{i2}]}$$

0.9999999836911013509096220241422493432630825471202

$$\frac{\Sigma\mathrm{Fijpn}[\mathrm{i2}]}{\mathrm{FEpp}[\mathrm{i2}]}$$

$9.008817132293679307814102603752407781912976991586 \times 10^{-19}$

ΣFijpn[i1]

$2.0784040103326326778137799124664109215133901626727 \times 10^{-44}$

-FYannoe[i1]

$2.07840401067159748312948823729874410893097057683810407823209272534584 \times 10^{-44}$

$$\frac{\Sigma\mathrm{Fijpn}[\mathrm{i1}]}{-\mathrm{FYannoe}[\mathrm{i1}]}$$

0.9999999998369110126927737348665609173101902904453

$$\frac{\Sigma\mathrm{Fijpn}[\mathrm{i1}]}{\mathrm{FEpp}[\mathrm{i1}]}$$

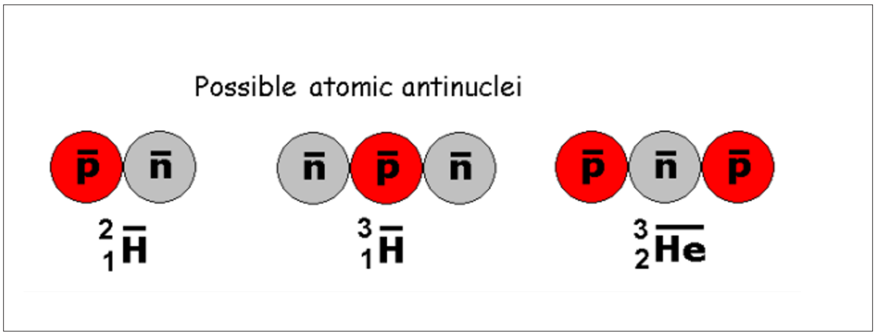
$9.008817277748328375844105299360936898868582754686 \times 10^{-19}$

```
ΣFijpn[i0]

2.0784040106682078333796832264459019933409722618767 × 10^-46

-FYannoe[i0]

2.07840401067159748312948823729874410893097057683810407823209272534584
 × 10^-46

 ΣFijpn[i0]
-----------
-FYannoe[i0]

0.9999999999983691093106052519738040310740214436647

ΣFijpn[i0]
----------
 FEpp[i0]

9.008817279202874866524405326317022172230950908268 × 10^-19
```

8.6 - Summary of results and the possible atomic nuclei

For distances **r** of 1 fermi (i15), the antiproton always attracts the antineutron with a **nuclear force 94.87 times greater than the electric force** and, the antineutron repel each other with a **nuclear force 10^{20} times greater than the force of gravity**. Furthermore, antiprotons repel each other at any distance r. Therefore, we must consider that the atomic antinuclei cannot form as a cluster of antiprotons and antineutrons. As a consequence of all these limitations, we can possibly only construct the following three antinuclei: an antiproton bound to an antineutron, two antineutrons bound to a central antiproton, or two antiprotons bound to a central antineutron.

Conclusion: The antimatter cannot exist in our universe.



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