

About Light of Null Object

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Abstract: The relativistic mass of the null object at the luminal speed in Heraclitean dynamics was calculated and compared to the mass of the neutron as a part of the neutron star.

Keywords: Heraclitean dynamics, null object, relativistic mass, luminal speed, neutron, neutron star

1. INTRODUCTION

The relativistic mass and the ground mass are in Heraclitean dynamics implicitly related as follows [1]:

$$m_{relativistic}^2 c^2 a^2 = e^{\frac{m_{ground}^2 c^2 - k(1 - \ln k) + m_{relativistic}^2 c^2 (a^2 - 1)}{k}} \quad (1)$$

Where k is the dynamics constant, c is the speed of light and m_{ground} is the ground mass of an object manifesting the relativistic mass $m_{relativistic}$ at the speed $a = \frac{v}{c}$.

The object of zero ground mass $m_{ground} = 0$ (null object) has the zero relativistic mass $m_{relativistic} = 0$ at infinite speed $a = \infty$ as well as it possesses the next relativistic mass at the luminal speed $a = 1$

$$m_{relativistic}(m_{ground} = 0, a = 1) = m_{null\ luminal} = \frac{e^{\frac{-1 + \ln k}{2}}}{c} \quad (2)$$

Applying the precise defined dynamics constant of variant ordinary matter [2] $k = \sqrt{1 + \frac{1}{c^2}} hc$ we have:

$$m_{null\ luminal} = \frac{e^{\frac{-1 + \ln(\sqrt{1 + \frac{1}{c^2}} hc)}{2}}}{c} \quad (3)$$

And for Planck's constant, $h = 6.62607015 \times 10^{-34} \text{kgm}^2 \text{s}^{-1}$, and the speed of light, $c = 2.99792458 \times 10^8 \text{ms}^{-1}$, the next exact value of the relativistic mass of the null object at luminal speed is calculated:

$$m_{null\ luminal} = 9.017\ 173\ 422\ 304\ 202\ 580\ 616\ 523\ 517\ 642\ 5 \dots \times 10^{-22} \text{kg} \quad (4)$$

Assuming that the neutron stars are made out of relativistic mass of null objects at luminal speed, the exact mass of the neutron can be predicted.

2. THE PREDICTED EXACT MASS OF THE NEUTRON

Taking into account the predicted exact mass of the electron [2] we have

$$m_{electron} = 9.109\ 383\ 711\ 780\ 844\ 986\ 554\ 646\ 210\ 790\ 3 \dots \times 10^{-31} \text{kg} \quad (5)$$

The relativistic mass of the null object at luminal speed (4) can be expressed in the units of the predicted exact mass of the electron, too

$$m_{null\ luminal} = 989\ 877\ 439.309\ 380\ 492\ 164\ 915\ 313\ 963\ 06 \dots m_{electron} \quad (6)$$

Out of the relativistic mass of the null object at luminal speed the neutron star unit could be made.

Taking into account the measured neutron to electron mass ratio [3]

$$\left(\frac{m_{neutron}}{m_{electron}}\right)_{experimental} = 1838.683\ 662\ 00(74). \quad (7)$$

Then three possible compositions of such a neutron star unit offer the prediction of the exact mass of the neutron.

3. FIRST POSSIBLE COMPOSITION: $m_{neutron\ star}^{26}$

Here the neutron star unit is composed of maximal number of 538362 neutrons and 26 electrons

$$m_{null\ luminal} = m_{neutron\ star}^{26} = 538362\ neutrons + 26\ electrons + 0\ preons \quad (8a)$$

It suggests the lowest exact neutron to electron mass ratio

$$\left(\frac{m_{neutron}}{m_{electron}}\right)_{lowest} = 1\ 838.683\ 661\ \mathbf{382}\ 825\ 110\ 548\ 135\ 481\ 261\ 8\ \dots \quad (8b)$$

Arising from the relativistic mass of null object at luminal speed (6)

$$m_{null\ luminal} = m_{neutron\ star}^{26} = 989\ 877\ 439.309\ 380\ 492\ 164\ 915\ 313\ 963\ 06\ \dots m_{electron}. \quad (8c)$$

4. SECOND POSSIBLE COMPOSITION: $m_{neutron\ star}^{25\frac{2}{3}}$

Here the neutron star unit is composed of maximal number of 538362 neutrons, 25 electrons and $\frac{2}{3}$ of the electron as 2 preons

$$m_{null\ luminal} = m_{neutron\ star}^{25\frac{2}{3}} = 538362\ neutrons + 25\ electrons + 2\ preons \quad (9a)$$

It suggests the intermediate exact neutron to electron mass ratio

$$\left(\frac{m_{neutron}}{m_{electron}}\right)_{intermediate} = 1\ 838.683\ 662\ \mathbf{001}\ 987\ 186\ 128\ 011\ 723\ 146\ 1\ \dots \quad (9b)$$

Arising from the relativistic mass of null object at luminal speed (6)

$$m_{null\ luminal} = m_{neutron\ star}^{25\frac{2}{3}} = 989\ 877\ 439.309\ 380\ 492\ 164\ 915\ 313\ 963\ 06\ \dots m_{electron}. \quad (9c)$$

5. THIRD POSSIBLE COMPOSITION: $m_{neutron\ star}^{25\frac{1}{3}}$

Here the neutron star unit is composed of maximal number of 538362 neutrons, 25 electrons and $\frac{1}{3}$ of the electron as 1 preon

$$m_{null\ luminal} = m_{neutron\ star}^{25\frac{1}{3}} = 538362\ neutrons + 25\ electrons + 1\ preon \quad (10a)$$

It suggests the highest exact neutron to electron mass ratio

$$\left(\frac{m_{neutron}}{m_{electron}}\right)_{highest} = 1\ 838.683\ 662\ \mathbf{621}\ 149\ 261\ 707\ 887\ 965\ 030\ 5\ \dots \quad (10b)$$

Arising from the relativistic mass of null object at luminal speed (6)

$$m_{null\ luminal} = m_{neutron\ star}^{25\frac{1}{3}} = 989\ 877\ 439.309\ 380\ 492\ 164\ 915\ 313\ 963\ 06\ \dots m_{electron} \quad (10c)$$

6. RESULT

All three possible predictions of the exact mass of the neutron are inside the interval of the measured neutron to electron mass ratio (7). Since

$$1\ 838.683\ 661\ \mathbf{26}\ \dots \leq \left(\frac{m_{neutron}}{m_{electron}}\right)_{experimental} = 1838.683\ 662\ \mathbf{00}(74) \leq 1838.683\ 662\ \mathbf{74}\ \dots \quad (11)$$

And

$$1838.683\ 661\ \mathbf{26}\ \dots < 1838.683\ 661\ \mathbf{38}\ \dots < 1838.683\ 662\ \mathbf{00}\ \dots < 1838.683\ 662\ \mathbf{62}\ \dots < 1838.683\ 662\ \mathbf{74}\ \dots \quad (12a)$$

So

$$1\ 838.683\ 661\ 26 \dots < \left(\frac{m_{neutron}}{m_{electron}}\right)_{lowest} < \left(\frac{m_{neutron}}{m_{electron}}\right)_{intermediate} < \left(\frac{m_{neutron}}{m_{electron}}\right)_{highest} < 1838.683\ 662\ 74 \dots \quad (12b)$$

7. CONCLUSION

Respecting Plato the correct theory is only one amongst many ones revealed in the realm of the reasonable ideas.

DEDICATION

To the North Star

REFERENCES

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ADDENDUM

The iron atom ^{56}Fe has 26 electrons and is involved in the formation of iron core of neutron star. Let's try to predict its possible exact mass.

If the neutron star unit is converted to iron core unit consisted of maximal number of 9 723 iron atoms ^{56}Fe and 83 833 electrons

$$m_{null\ luminal} = m_{iron\ core\ unit} = 9723\ \text{iron atoms} + 83\ 833\ \text{electrons} \quad (a)$$

It suggests the exact iron atom ^{56}Fe to electron mass ratio to be

$$\frac{m_{Fe}}{m_{electron}} = 101\ 799.198\ 427\ 376\ 374\ 798\ 407\ 416\ 842\ 85 \dots \quad (b)$$

Arising from the exact relativistic mass of null object at luminal speed (6)

$$m_{null\ luminal} = m_{iron\ core\ unit} = 989\ 877\ 439.309\ 380\ 492\ 164\ 915\ 313\ 963\ 06 \dots m_{electron} \cdot \quad (c)$$

The predicted exact mass of iron atom ^{56}Fe in kilograms is then the next (5)

$$m_{Fe} = 9.273\ 279\ 600\ 266\ 885\ 587\ 821\ 418\ 987\ 953 \dots \times 10^{-26}\ \text{kg}. \quad (d)$$

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