

Golden Object (Be the light)

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Abstract: The maximal kinetic mass of the golden object was calculated and compared to the rest mass of the electron.

Keywords: Heraclitean dynamics, minimal and maximal speed, maximal kinetic mass, golden object, luminal speed

1. INTRODUCTION

In the previous article [1] the object obeying Heraclitean dynamics [2] with the golden ratio (GR) of maximal to minimal extreme speed (let's call it golden object) was introduced. Both extreme speeds expressed in the units of the speed of light belong to the extreme relativistic mass and are related as follows:

$$a_{\text{maximal}} = \frac{a_{\text{minimal}} + \sqrt{(a_{\text{minimal}})^2 + 4}}{2}. \quad (1a)$$

So GR of the extreme speeds is achieved at the luminal minimal extreme speed $a_{\text{minimal}} = 1$ since:

$$\frac{a_{\text{maximal}}(1)}{a_{\text{minimal}} = 1} = a_{\text{maximal}}(1) = \frac{1 + \sqrt{(1)^2 + 4}}{2} = \frac{1 + \sqrt{5}}{2} = 1,618 \dots = GR. \quad (1b)$$

The free speed is related to the minimal speed:

$$a_{\text{free}} = \frac{1}{\sqrt{\ln\left(\frac{1}{\left(\frac{a_{\text{minimal}} + \sqrt{(a_{\text{minimal}})^2 + 4}}{2}\right)^2} + 1\right)}}. \quad (2a)$$

And the free speed of the golden object is related to the luminal minimal speed:

$$a_{\text{free}}(a_{\text{minimal}} = 1) = \frac{1}{\sqrt{\ln\left(\frac{1}{\left(\frac{1 + \sqrt{(1)^2 + 4}}{2}\right)^2} + 1\right)}} = \frac{1}{\sqrt{\ln\left(\frac{1}{(GR)^2 - 1} + 1\right)}} = \frac{1}{\sqrt{\ln(GR)}} = 1.441 \quad (2b)$$

The ground mass and the free speed of the ordinary matter are related by the dynamics constant

$$m_{\text{ground}}^2 a_{\text{free}}^2 c^2 = k = hc. \quad (3a)$$

So the ground mass of the luminal object is the next:

$$m_{\text{ground}} = \frac{\sqrt{\frac{h}{c}}}{a_{\text{free}}} = \frac{\sqrt{\frac{h}{c}}}{\frac{1}{\sqrt{\ln(GR)}}} = \sqrt{\frac{h}{c} \ln(GR)} = 1.031301878283814650628905 \dots \times 10^{-21} \text{ kg}. \quad (3b)$$

The relativistic mass of an object depends on its speed and is implicitly given for the ordinary matter by the next equation:

$$m_{\text{relativistic}}^2 c^2 a^2 = e^{\frac{m_{\text{ground}}^2 c^2 - hc(1 - \ln(hc)) + m_{\text{relativistic}}^2 c^2 (a^2 - 1)}{hc}}. \quad (4a)$$

With the extreme relativistic mass of the golden object achieved at the luminal speed $a = 1$ (See appendix)

$$m_{\text{extreme}} = \frac{e^{\frac{\ln(GR) + \ln(hc) - 1}{2}}}{c} = 1.147002177624696950760381 \dots \times 10^{-21} \text{ kg}. \quad (4b)$$

Golden Object (Be the light)

The mass equivalent of the extreme kinetic energy (kinetic mass) is the difference between the extreme relativistic mass and the ground mass:

$$m_{kinetic} = m_{extreme} - m_{ground} = 0.115700299340882300131476 \dots \times 10^{-21} kg. \quad (5)$$

2. COMMENT

All of the mentioned physical quantities can be written accurately to any number of decimal places, as they depend only on the exact value of Planck's constant, $h = 6.62607015 \times 10^{-34} kgm^2s^{-1}$, and the speed of light, $c = 2.99792458 \times 10^8 ms^{-1}$. Interesting is the kinetic mass of the golden object because the ratio of the kinetic mass of the golden object and the rest mass of the electron could be a whole number:

$$\frac{m_{golden\ object}^{kinetic}}{m_{electron}} = \frac{0.115700299340882300131476 \dots \times 10^{-21} kg}{9.1093837139(28) \times 10^{-31} kg} = 127012213.97(04). \quad (6a)$$

If the statement is correct, the exact value of the electron mass is in the palm of your hand:

$$m_{electron}^{predicted} = \frac{m_{golden\ object}^{kinetic}}{127\ 012\ 214} = 9.109383711780844961215777 \dots \times 10^{-31} kg. \quad (6b)$$

Is that it, or does the outcome just confirm the fact that gold cannot be pure? Anyway, the sub-luminal and super-luminal worlds are meeting.

3. CONCLUSION

Be the light

REFERENCES

- [1] Janez Špringer. "Golden Ratio near Border of Elliptic and Hyperbolic Universe" International Journal of Advanced Research in Physical Science (IJARPS), vol 12, no. 07, pp. 1-4, 2025.
- [2] Janez Špringer, (2019). Neutrino Relativistic Energy in Heraclitean World (Second Side of Fragment). International Journal of Advanced Research in Physical Science (IJARPS) 6(5), pp.1-3, 2019.

APPENDIX

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

For $a = 1$ we have

$$m_{relativistic}^2 c^2 = e^{\frac{m_{ground}^2 c^2 - hc(1 - \ln(hc))}{hc}}. \quad (b)$$

Rearranging gives

$$m_{relativistic}^2 c^2 = e^{\frac{m_{ground}^2 c^2}{h} + \ln(hc) - 1} \quad \text{and} \quad m_{relativistic} = \frac{e^{\frac{m_{ground}^2 c^2}{h} + \ln(hc) - 1}}{c}. \quad (c)$$

And by replacing (3b)

$$\frac{m_{ground}^2 c^2}{h} = \ln(GR). \quad (d)$$

The extreme relativistic mass of the golden object is given

$$m_{extreme} = \frac{e^{\frac{\ln(GR) + \ln(hc) - 1}{2}}}{c}. \quad (e)$$

ADDENDUM

The predicted exact rest mass of the electron is a little underestimated due to the use of an approximate value of the dynamics constant [3]

$$k = hc \sqrt{1 + \frac{1}{c^2}} = 1,000\ 000\ 000\ 000\ 000\ 005\ 563 \dots hc \sim hc. \quad (a)$$

Golden Object (Be the light)

That offers the concerned exact value only up to the seventeenth decimal place:

$$m_{electron}^{almost\ exact} = 9.109\ 383\ 711\ 780\ 844\ 961\ 215\ 777 \dots \times 10^{-31} kg. \quad (\beta)$$

But taking into account the tinny factor $\sqrt{1 + \frac{1}{c^2}}$ the exact value is given:

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

Citation: Janez Špringer. "Golden Object (Be the light)" *International Journal of Advanced Research in Physical Science (IJARPS)*, vol 12, no. 08, pp. 1-3, 2025.

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