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Graviton Mass Candidate

(Flirting article)

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Abstract: *The 28th alignment energy of the spin object - observable universe was proposed to coincide the graviton mass..*

Keywords: *Spin object energy, unaligned and aligned delocalization energy, alignment energy, continuous delocalization event, observable universe, graviton mass candidate*

1. Introduction

The alignment energy of the observable universe in the 18th step of the spin object continuous delocalization yielding 0.12 eV is in the range of the sum of neutrino masses [1]. The question arises whether the size of the graviton mass also coincides with some alignment energy of the observable universe.

2. Similarity between the 18th and 28th Spin Object Continuous Delocalization

Energy characteristics of the 18th step of the continuous spin object delocalization are the next [1] as follows:

The unaligned delocalization energy

$$E_{18}^{unaligned} = \frac{mc^2}{92{,}461{,}596{,}569{,}561{,}424{,}769{,}058{,}576{,}745{,}091{,}463{,}350{,}208{,}541.\mathbf{01785}}. \quad (1a)$$

The aligned delocalization energy

$$E_{18}^{aligned} = \frac{mc^2}{92{,}461{,}596{,}569{,}561{,}424{,}769{,}058{,}576{,}745{,}091{,}463{,}350{,}208{,}541}. \quad (1b)$$

And their difference - the alignment energy

$$E_{18}^{alignment} = E_{18}^{aligned} - E_{18}^{unaligned} = 2.0882\ x\ 10^{-90}\ mc^{2.}. \quad (1c)$$

We can see that in this step the alignment energy is relatively low due to low difference (only on the second decimal place of the denominator) between the unaligned $E_{18}^{unaligned}$ and aligned $E_{18}^{aligned}$ delocalization energy.

The similar low difference on the second decimal place of the denominator is recognized also in the 28th step as follows applying the continuous spin object delocalization event with the help of big number calculator [1], [2]:

The unaligned delocalization energy

$$E_{28}^{unaligned} = \frac{mc^2}{246{,}358{,}941{,}092{,}541{,}022{,}467{,}893{,}010{,}439{,}290{,}011{,}107{,}687{,}445{,}651{,}615{,}152{,}130{,}514{,}780{,}210{,}992.\mathbf{03589}} \quad (2a)$$

The aligned delocalization energy

$$E_{28}^{aligned} = \frac{mc^2}{246,358,941,092,541,022,467,893,010,439,290,011,107,687,445,651,615,152,130,514,780,210,992}. \quad (2b)$$

And their difference - the alignment energy

$$E_{28}^{alignment} = E_{28}^{aligned} - E_{28}^{unaligned} = 0.5914\ x\ 10^{-138}\ mc^2. \quad (2c)$$

Up to 62^{th} step of the continuous spin object delocalization event no more favourable decimal profile of the unaligned spin object delocalization energy is found. So, the 28th alignment energy of the observable universe should be the first candidate on the way of finding the graviton mass. Of course, assuming the latter is present here.

3. Result

For the spin object of the observable universe possessing $m_{universe}^{observable}c^2 = 5.61\ x\ 10^{88} eV$ the 28th alignment energy $E_{28}^{alignment}$ yields 3.3 x 10^{-50} eV. So, the graviton mass candidate is the next:

$$m_{graviton}^{candidate} = \frac{E_{28}^{alignment}}{c^2} = 0.59\ x\ 10^{-138}\ x\ 5.61\ x\ 10^{88}\frac{eV}{c^2} = 3.3\ x\ 10^{-50}\ \frac{eV}{c^2}. \quad (3)$$

4. Conclusion

If the graviton has such a mass the main consequences are **[3]**:

- Gravity is modified at distances $\gtrsim$ 40 Mpc.
- General Relativity is not exact — replaced by a massive gravity theory.
- Gravitational waves travel slower than light (but by an amount currently undetectable).
- Could contribute to explaining dark energy or modifying large-scale structure formation.
- Still consistent with current observational bounds.

Such a tiny mass would reshape our understanding of gravity, cosmology, and the quantum structure of space time.

5. Relaxation

To such an event belongs the next rolling speed [1]:

$$v_{28}^{rolling} = \sqrt{\frac{10}{7}\frac{E_{28}^{alignment}}{mc^2}}\,c = \sqrt{\frac{10}{7}\ 0.5914\ldots\ x\ 10^{-138}}\ \ c = 0.91919\ldots x\ 10^{-69}\,c. = 2{,}7557\ x\ \ 10^{-61}\ \frac{m}{s}. \quad (4)$$

Dedication

To the happiness that awaits us around the corner

References

[1] Janez Špringer. "Spin Object Continuous Delocalization (Embrace the Space)" International Journal of Advanced Research in Physical Science (IJARPS), vol 12, no. 05, pp. 3-5, 2025.

[2] https://www.calculator.net/big-number-calculator.html. Retrieved July 2025

[3] https://chatgpt.com/. Retrieved July 2025

[4] Janez Špringer (2022) "Speed at Zero Kinetic Energy in Heraclitean Dynamics" International Journal of Advanced Research in Physical Science (IJARPS) 9(8), pp.1-3, 2022.

Free Addendum

In Heraclitean dynamics following the relation $mv = \sqrt{hc}$ to the particle of ordinary matter [4] with such a low mass $m_{graviton}^{candidate} = 3.3\ x\ 10^{-50}\ \frac{eV}{c^2} = 5.9\ x\ 10^{-86}\ kg$ belongs a dizzying free speed of $v = 0.76\ x\ 10^{73}\frac{m}{s} = 0.25\ x\ 10^{65} c$

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