



Erratum to “How Could Linearized General Relativity and Quantum Gravitation Explain Dark Matter at CMB” [*Open Access Library Journal*, 13, (2026) 1-10]

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Abstract

The original online version of this article (Le Corre, S. (2026). How Could Linearized General Relativity and Quantum Gravitation Explain Dark Matter at CMB. *Open Access Library Journal*, 13, 1-10. [doi:10.4236/oalib.1115748](https://doi.org/10.4236/oalib.1115748)) contains an excessive approximation in the transition from relation (13) to relation (14), which renders the subsequently calculated values too imprecise.

Subject Areas

Classical Physics

Keywords

Erratum

The passage from relation (13):

$$\phi_{p-p_{GR}} = \frac{-Gm_p}{d_p} \left(1 + \frac{4}{c^2} g_{p_{GR}} \hbar_{GR} \frac{(\overline{S_{p_{GR}}} \wedge \overline{d_p}) \cdot \overline{v_p}}{d_p^2 m_p} \right)$$

to the relation (14):

$$\frac{4}{c^2} g_{p_{GR}} \hbar_{GR} \frac{(\overline{S_{p_{GR}}} \wedge \overline{d_p}) \cdot \overline{v_p}}{d_p^2 m_p} \approx 5$$

has been justified by this hypothesis:

“This proportion remains valid when summing over all protons, thus representing the overall baryonic masses of the Universe (left-hand side) and the pro-

portion of the DM term (right-hand side).”

This assumption is too crude because it does not take into account the fact that the influence of neighbors is not equivalent between the first Newtonian term and the second gravitic term. As a first approximation, the influence of the dipoles formed with these neighbors is weaker because it varies as r^{-2} unlike the Newtonian term varies as r^{-1} . But far from the proton, the influence of other protons is indeed cancelled out by the symmetry of the forces. However, for the Newtonian term, it is more reasonable to account for the influence of the local mass distribution by counting the number of particles N_{m_p} within a typical local volume. One must then sum the masses over a typical size. A way to obtain this number is to write $N_{m_p} = d_p^{-3} = 3 \times 10^8$ (with d_p the typical distance between protons at the CMB time).

The relation (14) then become:

$$\frac{4}{c^2} g_{p_GR} \hbar_{GR} \frac{(\overrightarrow{S_{p_GR}} \wedge \overrightarrow{d_p}) \cdot \overrightarrow{v_p}}{d_p^2 m_p N_{m_p}} \approx 5$$

The relation (16) and (17) are actually:

$$g_{p_GR} S_{p_GR} \hbar_{GR} \approx \frac{5}{5 \times 10^8} \Rightarrow \hbar_{GR} \approx 10^{-8} m^2 . kg . s^{-1} \approx 10^{26} \hbar$$

And the quantum of energy of the gravitational:

$$E = \hbar_{GR} \nu \approx 6 \times 10^{-8} \nu$$

The value of $\hbar_{GR}$ calculated in the original article ultimately represents a minimum value which, given the high density, is likely a rather poor approximation of reality. The true value should be closer to the result of this corrigendum, while almost certainly remaining lower.

Conflicts of Interest

The author declares no conflicts of interest.