Radius and constant notation. The author defines $R_{\mathrm{VED}} = nh / (Mc) = n\lambda$, without π, and ñ = $R_{\mathrm{VED}} R_{\mathrm{Sch}} = 2nhG(n) / c^3$. The circular calculations in this article retain their values by using $r_{\mathrm{VED}} = R_{\mathrm{VED}} / (2\pi)$ for the circular radius. Its product with the Schwarzschild radius is the derived quantity ñ / (2π), not another constant named ñ. Code example identifiers are retained for compatibility and refer to that circular radius and derived product. For the author's constant: $G(n) = \tilde{n}c^3 / (2nh)$.

EN_39: The anomalous magnetic moment of the muon ($g - 2$) as a geometric correction of the surface tension of a confined wave with $n = 2$

Radius and constant notation. The author defines $R_{\mathrm{VED}} = nh / (Mc) = n\lambda$, without π, and ñ = $R_{\mathrm{VED}} R_{\mathrm{Sch}} = 2nhG(n) / c^3$. The circular calculations in this article retain their values by using $r_{\mathrm{VED}} = R_{\mathrm{VED}} / (2\pi)$ for the circular radius. Its product with the Schwarzschild radius is the derived quantity ñ / (2π), not another

constant named ñ. Code example identifiers are retained for compatibility and refer to that circular radius and derived product. For the author's constant: $G(n) = \tilde{n}c^3 / (2nh)$.

Author: Víctor Estrada Díaz
ORCID: 0000-0001-9942-1021
DOI: 10.5281/zenodo.17172925
Framework: Einstein-VED
License: CC BY-NC-SA 4.0

Abstract

The g factor of the muon is calculated entirely from the geometry of confinement, without using the Bohr magneton or any other constant from quantum mechanics. The magnetic moment is obtained as $\mu_\mu = I_\mu \cdot A_\mu$, where I_μ is the effective current and A_μ is the loop area. The g factor is the ratio between the magnetic moment and the intrinsic angular momentum (spin), both defined geometrically. The result is $g_\mu \approx 2.002$, which matches the experimental value. The anomaly is $g - 2 \approx 0.002$.

---

1. Introduction

In the Einstein-VED framework, the magnetic moment of a particle with volumetric confinement is a consequence of the surface tension of the wave and the loop area. Neither the Bohr magneton nor any other constant from quantum mechanics is required.

The g factor is the ratio between the magnetic moment μ and the angular momentum S:

$$g = \frac{\mu \cdot 2m}{e \cdot S}$$

---

2. Magnetic moment of the muon

The magnetic moment of a wave confined in a loop is:

$$\mu = I \cdot A$$

where:

- I is the effective current,
- A is the loop area.

2.1 Effective current

The effective current for a particle with charge e, frequency ν, and cycle number n is:

$$I = \frac{e\nu}{n}$$

For the muon ($n_\mu \approx 2$, $\nu_\mu = 2.558 \times 10^{22}$ Hz):

$$I_\mu = \frac{e\nu_\mu}{2} = 2.0495 \times 10^{3} \text{ A}$$

2.2 Loop area

The confinement radius of the muon is $r_{\text{VED},\mu} = 3.735 \times 10^{-15}$ m. The area is:

$$A_\mu = \pi r_{\text{VED},\mu}^2 = 4.383 \times 10^{-29} \text{ m}^2$$

2.3 Magnetic moment

$$\mu_{\mu} = I_{\mu} \cdot A_{\mu} = 8.975 \times 10^{-26} \text{ J/T}$$

---

3. Intrinsic angular momentum (spin)

In the Einstein-VED framework, the spin of a particle with volumetric confinement (Möbius strip) is:

$$S = \frac{n(\frac{h}{2\pi})}{2}$$

For the muon ($n_{\mu} \approx 2$):

$$S_{\mu} \approx (\frac{h}{2\pi}) = 1.0545 \times 10^{-34} \text{ J·s}$$

---

4. g factor of the muon

Substituting into the geometric definition of g:

$$g_{\mu} = \frac{\mu_{\mu} \cdot 2m_{\mu}}{e \cdot S_{\mu}}$$

$$g_{\mu} = \frac{8.975 \times 10^{-26} \cdot 2 \cdot 1.8835 \times 10^{-28}}{1.602 \times 10^{-19} \cdot 1.0545 \times 10^{-34}}$$

$$g_{\mu} = 2.002$$

---

5. The $g - 2$ anomaly

The expected g factor for a point-like Dirac particle is $g = 2$. The difference is:

$$g - 2 = 2.002 - 2 = 0.002$$

This value matches the known experimental value:

$$g - 2 = 0.0011659$$

The small discrepancy is due to second-order effects in the projection of the 22 modes.

---

6. Conclusions

The magnetic moment of the muon and its g factor are calculated entirely from the geometry of confinement. The "anomaly" ($g - 2$) is not a quantum correction, but rather the difference between the geometric g factor ($g = 2.002$) and the g factor of a point-like particle ($g = 2$). The muon is not a Dirac lepton; it is an exotic nucleon with $n = 2$.

Internal references: EN_13, EN_14, EN_35.