Keystone Constant Relations in VAM

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Abstract

Abstracts are not typically included in appendices, but for standalone it is needed.

Keystone Constant Relations in VAM

Throughout the main text we defined the three primitive æther parameters

$$F_{\max}, \qquad r_c, \qquad C_e, \tag{1}$$

and showed how they fix all familiar quantum and gravitational constants. For completeness we collect here the four one-line identities that anchor $\hbar$, $E = h\nu$, the Bohr radius a_0 and Newton's constant G in terms of (1). All algebra employs only dimensional relations, the fine-structure constant $\alpha = 2C_e/c$, and the Planck time $t_P \equiv \sqrt{\hbar G/c^5}$. Figures quoted use the canonical numerics of Tab. 1.

0.1 Planck's Constant from Æther Tension

A photon of Compton frequency ν_e wraps two half-wavelength helical arcs ($n = 2$) around the electron vortex. Matching angular momenta and adopting a Hookean core gives

$$h = \frac{4\pi F_{\max} r_c^2}{C_e} = 6.626\,070 \times 10^{-34}\ \mathrm{J\,s}\,; \tag{2}$$

see Sec. 3.1.

0.2 Photon Energy: $E = h\nu$

Treating the helical photon as a parallel-plate capacitor of plate area $A = \lambda^2$ and spacing $d = \lambda/2$ yields

$$C = 2\varepsilon_0\,\lambda, \qquad\qquad E = \frac{Q^2}{2C} = \frac{e^2}{4\varepsilon_0 C_e}\,\nu = h\nu, \tag{3}$$

where $e^2/4\varepsilon_0 C_e = h$ follows from Eq. (2) plus $\alpha = 2C_e/c$.

0.3 Bohr (or Sommerfeld) Radius

Combining Eq. (2) with $\alpha = 2C_e/c$ gives

$$a_0 = \frac{\hbar}{m_e c\alpha} = \frac{F_{\max} r_c^2}{m_e C_e^2} = 5.291\,772 \times 10^{-11}\ \mathrm{m}. \tag{4}$$

All hydrogenic orbital radii then follow the textbook $r_n = n^2 a_0/Z$ scaling with no further parameters.

0.4 Newton's Constant

Eliminating $\hbar$ between Eq. (2) and the Planck-time identity $t_P^2 = \hbar G/c^5$ yields

$$G = F_{\max}\,\alpha\,\frac{(ct_P)^2}{m_e^2} = \frac{C_e c^5 t_P^2}{2F_{\max} r_c^2} = 6.674\,30 \times 10^{-11}\ \mathrm{m^3\,kg^{-1}\,s^{-2}}. \tag{5}$$

Either form in Eq. (5) matches all laboratory and astronomical measurements within the quoted CODATA uncertainty.

0.5 Consequences

A single triad $(F_{\max}, r_c, C_e)$ locks $\hbar, a_0, h\nu$, and G. Any independent experimental change to one of the three primitives would break *all* four constants simultaneously—making the VAM framework highly falsifiable.

Numerical Inputs (taken from Tab. 1): $F_{\max} = 29.053507\,\mathrm{N}$, $r_c = 1.40897017 \times 10^{-15}\,\mathrm{m}$, $C_e = 1.09384563 \times 10^{6}\,\mathrm{m\,s^{-1}}$, $m_e = 9.10938356 \times 10^{-31}\,\mathrm{kg}$, $t_P = 5.391247 \times 10^{-44}\,\mathrm{s}$.

The author first encountered the capacitor-wavelength derivation in a 2011 YouTube clip attributed to Lane Davis [**?**]. 's 2010 PDF later provided the written source used here.

References