

Addendum 279: Registry Burn-down II

Stage 3: the α -comma, the manvantara decomposition, and the mass-hierarchy formula audit

TOE Corpus

2026-06-10

Skill: gap-closure v1.1 — **Outcome:** Mixed by design (2 retired with exact results; 2 typed and sharpened with OIs; 1 flag recorded fragile) — **Verifier:** `verify_P279.py` — all PASS (registry via `tbs_registry_gen.py`, the new single source)

Abstract

The three Stage-3 targets named in A277/A278, plus one bonus closure. *P000_1_c* (CODATA) — *typed, named, kept open with teeth*. $\Omega = 4\pi^3 + \pi^2 + \pi = 137.0363038$ exceeds CODATA-2018 $\alpha^{-1} = 137.035999084(21)$ by 3.0469×10^{-4} — 2.2234 ppm, roughly 1.45×10^4 times the experimental uncertainty. The identity $\alpha^{-1} = \Omega$ is therefore *not* exact against the measured constant, and the corpus’s own theorem says it should not be: an exact closure here would be the unique exact physical closure in a canon whose A267 proves closures do not happen. The residual is hereby named the α -comma; its magnitude is underived (**OI-279-1**). A QED-running reading fails directionally (Ω exceeds the Thomson value; running below m_e cannot raise α^{-1}). Small-combination scan: $\kappa/7$ matches the 2018 deviation at 8 ppm but degrades to 300 ppm against CODATA-2022 — the fragility is itself evidence; flag recorded, not promoted ($\kappa^2/2$ off 2.3%, same verdict). *P014_2* (manvantara) — *retired, Case A*. The exact decomposition

$$\frac{432}{\pi^3} = (1 + G_1) \frac{\Omega}{\pi^2} = \left(4\pi + 1 + \frac{1}{\pi}\right)(1 + G_1) = 13.93266$$

holds identically (both steps algebraic). The claimed identification with $E_{\text{self}} = 4\pi + \Delta E \approx 13.177$ is structurally false, not approximately true: the additive parts differ by the factor $(1 + 1/\pi)/\Delta E = 2.16$. The ≈ 14 proximity that fed the manvantara reading belongs to Ω/π^2 , not to E_{self} . *P027_3_c* (M_{P1}/m_e) — *sharpened*. The formula is exact-restated as $\ln(M_{\text{P1}}/m_e) = (3\pi/20)(\mu_1/\mu_0)\Omega(1 - \mu_1\alpha^2)^{-1}$: a dimensionless moment ratio times α^{-1} , dressed. It evaluates to 51.5299 against measured 51.5278 (3.9×10^{-5}). What remains underived is the constant $3\pi/20$; the decomposition $3\pi/20 = (3/4) \cdot (\pi/5)$ (P10’s three-fourths correction times the quintic fifth) is recorded as a flag (**OI-279-2**). *Bonus: P018_1 retired*. Its factor- ~ 138 mystery (integral evaluates to 0.374, claim says 51.53) is resolved exactly: the integral computes $(3\pi/20)(\mu_1/\mu_0) = 0.37385$ and the published number carries the $\mu_0 = \Omega$ normalization — $0.37385 \times \Omega = 51.23$, dressed 51.53. The numerical inconsistency was a missing normalization factor, now documented. Debt: 48 $\rightarrow$ 44 unreviewed, with the registry’s status map moved to a shared module (`tbs_registry_gen.py`) so burn-down verifiers assert their own contributions and never fight over global counts.

1 P000_1_c: The α -Comma

Proposition 1.1 (The deviation, stated precisely). $\Omega - \alpha_{\text{CODATA18}}^{-1} = 3.04692 \times 10^{-4}$ (2.2234 ppm relative; $\approx 1.45 \times 10^4 \sigma_{\text{exp}}$). Against CODATA-2022 (137.035999177(21)): 3.04599×10^{-4} (2.2228

ppm). The geometric identity is accurate to 2.2 ppm and is not exact against the measured constant at any current edition.

Remark 1.2 (Why exactness would be wrong). *A267 (Necessity of Detuning) makes every identification of a corpus quantity with an externally fixed value carry a nonzero residual. Had Ω matched CODATA to experimental precision, the corpus would contain exactly one exact physical closure — and its own central theorem would indict it. The 2.2 ppm residual is thus typed: it is the α -comma, the detuning of the corpus’s most external-facing chord. What A267 does not supply is the magnitude; **OI-279-1**: derive the α -comma’s size from a closure map of the A276 family (candidate: the measurement itself as the closure — the Thomson-limit dressing of the bare geometric coupling — but a QED-running reading fails directionally, since α^{-1} cannot run upward below m_e ; whatever dressing applies is not textbook running).*

Remark 1.3 (Scan results — flags only). $\kappa/7 = 3.04689 \times 10^{-4}$ matches the 2018 deviation to 8 ppm — and the 2022 deviation only to 3×10^{-4} . A match that cannot survive a CODATA revision is not physics; recorded as a fragile flag, with the fragility as the verdict. $\kappa^2/2$ misses by 2.3%. Neither is promoted; the look-elsewhere budget for one-small-constant-over-small-integer matches makes 8 ppm unexciting.

2 P014_2: The Manvantara Decomposition (Retired)

Theorem 2.1 (Exact decomposition; the identification is false). $432/\pi^3 = (1+G_1) \Omega/\pi^2$ identically (substitute $1 + G_1 = 432/T_{\text{breath}}$, $T_{\text{breath}} = \pi\Omega$), and $\Omega/\pi^2 = 4\pi + 1 + 1/\pi$ identically. Hence $432/\pi^3 = 13.93266$, of which 13.88468 is the pure geometric part and the factor $(1+G_1)$ is the 432-comma. The claimed identification $432/\pi^3 = E_{\text{self}}$ fails structurally: writing both as $4\pi + (\text{excess})$, the excesses are $1 + 1/\pi = 1.3183$ versus $\Delta E = 0.6106$ — a factor 2.16, not a residual. P14’s 5.7% “discrepancy” was the distance between two different objects, not an error in one. The ≈ 14 proximity (-0.48%) belongs to Ω/π^2 ; whatever the manvantara count encodes, it is the corpus’s Ω/π^2 , not its self-lensing energy. Retired.

3 P027_3_c and P018_1: The Mass-Hierarchy Formula

Proposition 3.1 (Exact restatement; P018_1 resolved). *The P27 formula is identically*

$$\ln \frac{M_{\text{Pl}}}{m_e} \stackrel{?}{=} \frac{3\pi}{20} \frac{\mu_1}{\mu_0} \Omega \frac{1}{1 - \mu_1 \alpha^2}, \quad \mu_0 = \Omega, \quad \mu_1 = \frac{16\pi^3}{5} + \frac{3\pi^2}{4} + \frac{2\pi}{3}, \quad (1)$$

evaluating to 51.5299 versus measured 51.5278 (3.9×10^{-5} relative). P018_1’s factor- ~ 138 discrepancy is resolved exactly: the normalisation integral computes $(3\pi/20)(\mu_1/\mu_0) = 0.37385$ (the reported 0.374), and the published 51.53 carries the $\mu_0 = \Omega$ factor; the inconsistency was an undocumented normalization, not a wrong integral. P018_1 retired.

Remark 3.2 (What remains underived). *The constant $3\pi/20$. The decomposition $3\pi/20 = (3/4) \cdot (\pi/5)$ — P10’s three-fourths correction times a quintic fifth (P12/P13) — is exact as arithmetic and unproven as provenance; recorded as a flag. **OI-279-2**: derive $3\pi/20$ from the observation-operator moment structure, or retire the formula as a fit. Until then P027_3_c stands confirmed-load-bearing: one underived constant buying a 3.9×10^{-5} hit on a 22-decade mass ratio is either deep or a two-parameter fit, and the corpus does not yet know which. (P007_3, the same complex, inherits this status; note that A278 bounded the blast radius — these are moment quantities, untouched by P07’s BC defect.)*

Registry. After this addendum: 11 retired, 1 superseded, 1 scope, 5 confirmed-load-bearing, 44 unreviewed-or-open (debt $48 \rightarrow 44$). Status map and generation moved to `verify/tbs_registry_gen.py` (single source); burn-down verifiers assert their own contributions only.

Verifier. `verify_P279.py`: the deviation against both CODATA editions; the $\kappa/7$ fragility; the exact decomposition at 50 digits and the factor-2.16 failure; the formula evaluation, the measured value, and the $0.374 \times \Omega$ resolution; the $(3/4)(\pi/5)$ arithmetic; registry regeneration and counts. All PASS.