

Addendum 288: The Variance Weight

Layer equipartition derives the edge factor;
the α -comma chain completes to one soft link

TOE Corpus

2026-06-10

Skill: gap-closure v1.1 — **Outcome:** Case B+ (four-link chain, three links canon, one named assumption; rival demoted) — **Addresses:** OI-283-1 (reduced to the equipartition link) —
Verifier: `verify_P288.py` — all PASS

Abstract

A284 left the amplitude correction bracketed between the motivated $1 - \pi/\Omega$ and the unmotivated $1 - 1/44$. The motivated candidate is here upgraded from “texture” to a four-link chain, of which three links are filed canon and the fourth is a single named assumption. *Link 1 (oscillation)*: the coupling oscillates with total relative amplitude κ about Ω (P03; the standing reading of A283). *Link 2 (equipartition)*: the oscillation’s variance is apportioned across the three layers by their measure fractions $(4\pi^3, \pi^2, \pi)/\Omega$ — the named assumption, natural for a mode paced by the single clock (A269: one rhythm, no private dynamics; the layer fractions are the corpus’s only measure) but not yet a theorem. *Link 3 (edge unobserved)*: observation has no support on the edge sector (A281: observation vanishes at the universe boundary; P04: the edge is where observation runs out), so a measurement of the coupling samples the bulk and boundary shares only: observed variance = $\kappa^2(1 - \pi/\Omega)$. *Link 4 (averaging)*: the linear time-average of the sampled oscillation (A283; exponent $n = 0.955 \approx 1$ data-selected) gives

$$\alpha_{\text{meas}}^{-1} = \Omega \sqrt{1 - \kappa^2(1 - \pi/\Omega)} = 137.035999236.$$

Against CODATA-22 (137.035999177(21)): $+0.43$ ppb, $2.8\sigma_{\text{exp}}$. The rival $1 - 1/44$ fits the current edition marginally better and possesses *no* chain — no mechanism, no provenance for 44, no link to any corpus structure; per the A245/A180 convention a chained candidate at 2.8σ outranks an unchained one at 0.5σ , because chains are falsifiable in more places than fits. The bracket of A284 is therefore resolved into a ranking: **edge equipartition is adopted as the working identification**, $1/44$ demoted to coincidence-watch, and OI-283-1 reduces to one question — prove or refute Link 2 (derive variance equipartition by layer measure from the kernel, or compute the actual layer decomposition of the P03 oscillation mode). The prediction’s falsification conditions are inherited from A284 and remain in force.

1 The Chain

Proposition 1.1 (Deficit from the chain). *Links 1–4 jointly imply relative deficit $= 1 - \sqrt{1 - \kappa^2(1 - \pi/\Omega)}$ = 2.22234×10^{-6} , against observed 2.22276×10^{-6} (CODATA-22; agreement 1.9×10^{-4}) and 2.23344×10^{-6} (CODATA-18; 5.0×10^{-4}). Equivalently $A = \kappa \sqrt{1 - \pi/\Omega} = 0.98847 \kappa$, inside A283’s measured $0.9887(2) \kappa$ at the 2×10^{-4} level — the residual mismatch is exactly the $2.8\sigma_{\text{exp}}$ tension of the closed-form prediction and is owned by the chain, not absorbed.*

Remark 1.2 (The soft link, precisely). *Link 2 asserts: writing the oscillation as a sum of layer components, $\kappa^2 = \sum_{\ell} \kappa_{\ell}^2$ with $\kappa_{\ell}^2 = \kappa^2 f_{\ell}$, $f_{\ell} = (4\pi^3, \pi^2, \pi)/\Omega$. What would prove it: decompose P03's fundamental perturbation mode against the layer decomposition of the density and show the variance shares equal the measure shares (a computation, in principle, on the wave equation of P03 §5 — filed as the operative content of OI-283-1). What would refute it: variance shares $\neq$ measure shares; the prediction then moves and the comparison with CODATA re-runs mechanically (the verifier parametrizes the edge share).*

Remark 1.3 (Ranking, not proof). *The adoption of the edge identification is a ranking by chain length under the corpus's own convention, made while the unchained rival fits the current CODATA edition better. This is recorded plainly because it is the kind of judgment call a future measurement settles: at 0.1 ppb the two candidates separate by $\sim 3\sigma$ of current precision (A284), and Link 2's computation may settle it sooner from the theory side.*

Consequences. OI-283-1 reduces to the Link-2 computation (variance decomposition of the P03 mode by layer). A284's bracket resolves to a working identification with the rival on coincidence-watch. The registry note for P000_1.c is updated; the α -comma now reads, end to end: *geometric value, dressed by the corpus's own oscillation, averaged over the observed sector, agreeing with experiment at the half-ppb level, with one named computation between the chain and a derivation.*

Verifier. `verify_P288.py`: the chain arithmetic at 40 digits; both CODATA comparisons; the A -value against A283's measurement; the parametrized-share machinery (prediction as a function of the edge share, with the measure-share value marked); the ranking convention check (chained 2.8σ vs unchained 0.5σ); registry note. All PASS.