

Addendum 271: The Temperament Audit

$\sqrt{1-\kappa}$: exact physics or comma? Diagnosis, branch table,
and the robustness of the chain

TOE Corpus

2026-06-10

Skill: gap-closure v1.1 — **Outcome:** Case B+ (question sharpened to a unit bridge; both branches computed; chain proven branch-independent; tempered reading argued, not proven) —
Verifier: `verify_P271.py` — all PASS

Abstract

OI-269-1 asked whether the covering-lift factor $\sqrt{1-\kappa}$ (P28 TBS 28.2, a 0.107% deviation of the arc-speed from 2π) is exact physics or an artifact. The audit sharpens the question to its actual content: **the corpus carries two time normalizations** — P03’s density-oscillation time (in which $\omega_1 = \pi\sqrt{1-\kappa}$) and P14’s system units (in which $T_{\text{breath}} = \pi\alpha^{-1}$) — *with no documented conversion between them*. The dimensionless, normalization-free quantity is windings-per-breath, and it takes different values under the two candidate bridges: Branch A (P14 unit $\equiv$ arc-radian time): T_{breath} windings, $\rho_A = 0.5122$, ladder $q = 2, 41, 449$, near-tritone; Branch B (P14 unit $\equiv$ P03 time): $T_{\text{breath}}\sqrt{1-\kappa}$ windings, $\rho_B = 0.0529$, CF $[0; 18, 1, 9, \dots]$, ladder $q = 18, 19, 189, 208$, Brjuno sum 0.523. **Robustness theorem:** the a_0 chain (A265/A269), the 432 derivation, and the G_1 identity (A266/A267) use $T_{\text{breath}} = \pi\alpha^{-1}$ definitionally and are *identical in both branches* — the corpus’s strongest chain is immune to its deepest unresolved normalization. Both branches are Brjuno (A268’s response theory holds in either). What is branch-dependent: A267’s scale ladder and the tritone reading. Coherence argument, flagged as argument: A267’s Necessity of Detuning makes an *exactly*- 2π arc the only untempered closure in the canon — suspicious by the canon’s own theorem — and the deviation sits 5.5% from the schisma (A266 flag). The tempered Branch B is adopted as *working hypothesis*; decision requires deriving the P03 $\leftrightarrow$ P14 unit bridge, filed as **OI-271-1** (and now the precise, final form of the old TBS 28.2).

1 The Branch Table

	Branch A (2π exact)	Branch B (tempered)
windings/breath	430.5122	430.0529
ρ	0.51225	0.05290
CF	$[0; 1, 1, 19, 1, 10, \dots]$	$[0; 18, 1, 9, 1, 1, \dots]$
ladder q	2, 41, 449	18, 19, 189, 208
Brjuno sum	2.803	0.523
structure	near-tritone (period 2)	near-1/19 (period 19)
ladder in SI	2.7, 56 Myr	25, 26, 260 Myr

Theorem 1.1 (Branch independence of the chain). $a_0 = \alpha^3 c^2 / (\pi^2 L_h)$ (A265/A269), 432 = *nearest 3-smooth integer to $\pi\alpha^{-1}$* (A267 Thm 1.2), and $G_1 = 432/T_{\text{breath}} - 1$ (A266) involve only

$T_{\text{breath}} = \pi\alpha^{-1}$ as a defined corpus constant and contain no winding count: they are invariant across the branch table. (Branch B's winding count 430.053 also has nearest 3-smooth 432, so even the winding-referred reading of the 432 theorem survives.) A268's Brjuno-based response theory holds in both branches.

Remark 1.2 (Coherence, and what would decide). For Branch A, the arc closes on exactly 2π — the unique exact closure in a corpus whose own A267 proves closures do not happen; for Branch B, the arc is tempered like everything else, by an amount 5.5% from the schisma (flagged near-miss, A266). Coherence favors B; coherence is not proof. The decider is the unit bridge: a derivation of P14's system unit from P03's oscillation time (or an independent physical determination of windings-per-breath). **OI-271-1** replaces and retires TBS 28_2 as the precise statement of what was always missing. A267's ladder results are hereby marked branch-conditional; its Necessity-of-Detuning and 432 theorems are unconditional.

Verifier. `verify_P271.py`: both branch computations (CFs, ladders, Brjuno sums), the branch-independence assertions, the 432-invariance in both readings; all PASS.

Note (added 2026-06-10, same day). OI-271-1 is closed by A273: the unit bridge is *derived* from P14's Breathing-Period theorem (the system unit is the tempered fundamental period $\tau_1 = 2/\sqrt{1-\kappa}$), and the working hypothesis adopted above — Branch B — is **overturned**: no register yields the count $T_{\text{breath}}\sqrt{1-\kappa}$, and the density register carries exactly T_{breath} windings per breath (Branch A's number, with corrected derivation). The coherence argument's suspicion of an exact 2π closure is dissolved rather than confirmed: the exactness is definitional (a unit conversion), not dynamical, so the Necessity of Detuning is not violated. The branch table above remains correct as a table of *readings*; column B is now known to be unphysical. The robustness theorem is unaffected. TBS 28_2 is retired. See A273.