

Addendum 392: The Collapse/Rebound Ratio Is One

The derivation 391 called for, run and accepted: the breath's infall/rebound asymmetry is causal, not magnitudinal — so it does not rescue H_0

(Settles the open derivation of Addendum 391; Papers 14, 13, 17, 30; Addendum 369)

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Abstract

Addendum 391 diagnosed the H_0 over-prediction ($H_0 = 2\alpha^2/T_{\text{breath}} = 75.8$, $\sim 3\sigma$ high) as a possibly flattened breath asymmetry: 369 identifies the driven-collapse *infall* gain a_0 with the rebound-projection *expansion* (de Sitter) temperature as “one temperature read two ways” ($F = 2\pi$), while Paper 14 (line 273) calls those phases “not symmetric in mechanism.” 391 left the fix *open* and named the single derivation that would settle it: derive the collapse/rebound *magnitude* ratio from Paper 14's C and P operators, then read off H_0 and accept it. This addendum runs that derivation, and the result is a clean negative. **The corpus forbids the shortcut and supplies the substitute.** Paper 14 (line 259) states that $C \circ P = I$ “is compositional, not dynamical ... without by itself fixing rates, amplitudes, or periods”; the amplitudes are fixed instead by the oscillation theory — the parameter $\kappa = \alpha^{5/4}$ and frequency $\omega_1 = \pi\sqrt{1-\kappa}$ (Paper 13), realised as the breath map's lapse $m = \sqrt{1-u^2}$, $u = \cos 2\beta$ (Paper 30). **That structure is magnitude-symmetric.** The lapse is a mirror image across the breath phase: the inward (collapse) and outward (projection) halves have equal amplitude, as $x(t) = A \cos \omega t$ has equal in- and out-swing. The largest asymmetry the oscillation parameter can carry is κ itself, entering as $\sqrt{1-\kappa}$ (-0.11%) or $1-\kappa$ (-0.21%); either leaves H_0 at 75.6–75.7. **The data need 33× more.** The required correction is -3.5% (SH0ES) to -11% (Planck); the available principled asymmetry, $\sim 0.1\%$, is about 33× too small. **Verdict.** The Paper-14 asymmetry is *causal* — which phase is the driver and which the rebound — not *magnitudinal*; the magnitudes are mirror-symmetric to within $\alpha^{5/4} \sim 0.2\%$. So 369's symmetric identification stands, $F = 2\pi$ holds, and $H_0 = 75.8$ is unmoved by this mechanism. 391's rescue is killed cleanly: the H_0 overshoot is *not* in the infall/rebound ratio, and the fix lies deeper — the chart anchoring ($c = \pi/\alpha$, T_{breath}), the closure hypothesis (370), or the data — confirming 388/389. One unmotivated factor that lands near the window ($1 - \alpha^{5/8} \rightarrow H_0 = 72.3$) is flagged as the numerology trap and rejected. All claims pinned by `verify_P392.py` (9/9).

1 The corpus forbids the shortcut and names the substitute

Proposition 1.1 ($C \circ P = I$ does not fix the ratio). *Paper 14, line 259: “The identity $C \circ P = I$ is compositional, not dynamical: it constrains what the composition of the two operators must yield, without by itself fixing rates, amplitudes, or periods. To extract a period from it, additional structure must be supplied, and the structure available ... is the oscillation theory ... a fundamental frequency $\omega_1 = \pi\sqrt{1-\kappa}$ set by the oscillation parameter $\kappa = \alpha^{5/4}$.” So the collapse/rebound magnitude ratio cannot be read off the operators C and P alone; whatever asymmetry exists in the magnitudes must enter through the oscillation theory. The derivation 391 requested is therefore a question about κ and the breath map, not about C and P in isolation.*

2 The oscillation is magnitude-symmetric

Theorem 2.1 (The breath’s inward and outward amplitudes are equal to within κ). *The oscillation theory realises the breath as the GON dynamics (Paper 30) with lapse $m = \sqrt{1 - u^2}$ and Hopf latitude $u = \cos 2\beta$. As β advances, u traces a symmetric path and $m = |\sin 2\beta|$ is a mirror image across each turning point: the collapse half and the projection half have equal amplitude, exactly as a harmonic oscillation $x(t) = A \cos \omega_1 t$ has equal inward and outward swing. The only quantity that distinguishes the dynamics from a perfectly symmetric oscillation is the parameter $\kappa = \alpha^{5/4} \approx 2.13 \times 10^{-3}$, which can enter an amplitude asymmetry at most as $\sqrt{1 - \kappa}$ (a -0.11% effect) or $1 - \kappa$ (-0.21%). Hence the collapse/rebound magnitude ratio is 1 to within $\alpha^{5/4}$.*

Corollary 2.2 (The asymmetry is far too small to move H_0). *With $H_0 \propto F$ and $F = 2\pi r$ for an asymmetry factor r , the largest principled r available is $\sqrt{1 - \kappa} = 0.99893$, giving $H_0 = 75.72$; $1 - \kappa$ gives 75.64. The data require $r = 0.965$ (SH0ES, -3.5%) down to $r = 0.889$ (Planck, -11%). The available asymmetry, $\sim 0.1\%$, is about $33\times$ smaller than the smallest correction the data need. The mechanism cannot reach the window.*

3 Verdict: causal, not magnitudinal

Theorem 3.1 (369’s symmetric identification stands; 391’s rescue is closed). *By Proposition 1.1 and Theorem 2.1, Paper 14’s “not symmetric in mechanism” (line 273) is a statement about which phase is the driver (C , the continuous generator) and which is the rebound (P , “the form that failure takes”) — a causal asymmetry. It is not a magnitude asymmetry: the oscillation that fixes the amplitudes is mirror-symmetric to within $\alpha^{5/4}$. Therefore 369’s identification of a_0 (infall) with the expansion temperature at $F = 2\pi$ is correct at the level of magnitudes, $H_0 = 75.8$ is unmoved, and the candidate rescue of Addendum 391 is closed. The H_0 overshoot is not located in the collapse/rebound ratio.*

Remark 3.2 (The trap, flagged and rejected). One factor lands temptingly close: $1 - \kappa^{1/2} = 1 - \alpha^{5/8} = 0.9538$ gives $H_0 = 72.3$, $\sim 1\sigma$ from SH0ES. But $\alpha^{5/8}$ is *not* the oscillation parameter — that is $\alpha^{5/4}$ — and the square root is inserted for no reason other than that it lands. Adopting it would be precisely the $\delta_{CP} = 240^\circ/\text{PRVE}$ numerology the corpus has refused and registered (A344, P40): a coincidental fit dressed as a derivation. It is recorded here to be *rejected* unless an independent derivation of the $5/8$ power is found. The discipline that produced this addendum’s negative is the same discipline that rejects this factor: the ratio is whatever the oscillation theory says it is, and the oscillation theory says it is 1.

Remark 3.3 (Where the H_0 fix must now be sought). With the horizon *shape* (389: forced 2π), the family/CPT *orbifold* (390: deficits overshoot), and now the breath *dynamics* (this addendum: ratio = 1) all exhausted, the H_0 over-prediction is confirmed structural along every near-surface axis. The remaining candidates are the ones 388/389 already named as deeper: the $a_0 = cH_0/2\pi$ chart anchoring itself (the identifications $c = \pi/\alpha$ and the breath-to-Myr calibration of T_{breath}), the closure hypothesis (370) on which the whole bridge is conditional, or an upward revision of the measured H_0 . This addendum does not choose among them; it removes one, by derivation.

Status

This settles the open derivation of Addendum 391. Asked to derive the collapse/rebound magnitude ratio from Paper 14’s C and P operators and accept the result, the derivation returns 1. Paper 14

(line 259) forbids reading the ratio from $C \circ P = I$ (which fixes no amplitudes) and routes it to the oscillation theory ($\kappa = \alpha^{5/4}$, $\omega_1 = \pi\sqrt{1-\kappa}$; Proposition 1.1); that theory, realised as the GON breath lapse $m = \sqrt{1-u^2}$, is magnitude-symmetric, carrying at most an $\alpha^{5/4} \sim 0.1\text{--}0.2\%$ asymmetry (Theorem 2.1), about $33\times$ too small for the 3.5–11% the data demand (Corollary 2.2). So Paper 14’s “not symmetric in mechanism” is causal, not magnitudinal; 369’s symmetric $F = 2\pi$ stands and $H_0 = 75.8$ is unmoved (Theorem 3.1). 391’s rescue is closed — the overshoot is not in the infall/rebound ratio — and the fix lies deeper (the chart anchoring, the closure hypothesis 370, or the data; Remark 3.3), confirming 388/389. The tempting unmotivated factor $1 - \alpha^{5/8} \rightarrow 72.3$ is flagged and rejected (Remark 3.2). An honest negative, derived and accepted. No published number changes. Verifier: `verify_P392.py`, 9/9 pass.