Same-carrier energy, clock and support

Theorem manuscript v0.1 · 21 October 2026 · Benjamin Walker Mayes
AI-assisted constructor proof: Codex · Independent review pending

Abstract. On the declared filled-tetrahedron active sector, energy and a primitive signed state recurrence identify A_0 times the native support a, rather than A_0 alone. We prove a normalization ambiguity preserving the apparatus trajectory, energy and clock. We also show why quadratic readouts can report half the state period, then give a finite action interval once independent support and clock certificates are supplied.

Status. EXACT CONDITIONAL. Development - no registry entry. No apparatus or dataset is admitted; physical promotion remains 0.

1. Declared same-carrier map

On the nonzero active sector let $A=2J$, $J^T=-J$ and $J^2=-I$. Native evolution is $dx/ds=Ax$, with $a=\|x\|^2>0$. Let $z=Mx$ for injective M, physical time $t=\tau_0 s$, and measured subsystem energy $E(z)=z^TGz/2$ with a calibrated baseline. The proposed physical map must satisfy both

$$KM = MA/\tau_0, \quad M^TGM = (2A_0/\tau_0)I.$$

Here $dz/dt=Kz$ on the invariant image. These conditions are hypotheses; matching spectra or units does not verify them. The source native energy $H=a$ gives $E=(A_0/\tau_0)a$ under this map.

2. Product identification and ambiguity

Theorem 1. The primitive full-state recurrence is $T_{state}=\pi\tau_0$, and

$$A_0 a = E\, T_{state}/\pi.$$

Without an independent support scale, A_0 is not identified in the map class admitting, for every $c>0$,

$$x'=cx, \quad M'=M/c, \quad a'=c^2a, \quad A'_0=A_0/c^2.$$

Proof. The flow is $\cos(2s)I+\sin(2s)J$, so nonzero real x first returns at $s=\pi$. The energy pullback gives $E=(A_0/\tau_0)a$. Multiplication proves the product identity. Substitution preserves both map equations and $M'x'=Mx$ while $A'_0a'=A_0a$. Thus every observation of the unchanged physical trajectory and energy is preserved while A_0 varies. Additional independently justified amplitude constraints may remove this ambiguity. □

Constructive matrix calibration

Given an independently calibrated absolute M and left inverse L with $LM=I$, verify $KM=M(LKM)$, $LKM=\gamma A$ and $M^TGM=\lambda I$, with $\gamma,\lambda>0$. These conditions reconstruct the map and give $\tau_0=1/\gamma$ and $A_0=\lambda/(2\gamma)$. This target-blind extraction still requires the absolute amplitude map; spectra or energy alone do not establish it.

3. Why measured energy is not E_0

The earlier monomial-anchor theorem remains valid: independently known $E_0=A_0/\tau_0$ and τ_0 determine A_0. But measured total energy is $E=E_0a$. An unknown a is an unknown calibration factor. In log variables (A_0,τ_0,a), energy and state period constrain exponent rows (1,-1,1) and (0,1,0). The action target (1,0,0) is outside their row span. The ambiguity vector (-1,0,1) preserves both anchors; an independent norm row (0,0,1) closes the rank condition.

4. Readout parity and the clock

Theorem 2. Every even readout f(-x)=f(x) repeats within half a state cycle, or is constant. A nonconstant homogeneous quadratic readout along this orbit has primitive period $T_{state}/2$. A nonzero signed linear orbit projection has period T_{state}.

Proof. At $s=\pi/2$ the flow is -I. A quadratic form along $\cos(2s)x+\sin(2s)Jx$ contains only a constant and sine/cosine terms of frequency 4. If nonconstant, its primitive period is $\pi/2$. A nonzero linear projection has frequency 2 and primitive period π. More general even readouts can repeat faster; no universal primitive period is asserted for them. □

For example, $x_1=\cos(2s)$ has period π, x_1^2 has period $\pi/2$, and the conserved energy has no nonconstant period. A sign-blind or projective readout cannot certify the signed state recurrence without an appropriate reference. No physical spinor or quantum phase identity is inferred.

5. Finite action interval

Certify $\rho=T_{read}/T_{state}$ for the actual readout. Then $A_0=E\,T_{read}/(\pi\rho a)$. For jointly valid positive intervals in E, T_{read}, ρ and a, monotonicity gives

$$E_-T_-/(\pi\rho_+a_+) \le A_0 \le E_+T_+/(\pi\rho_-a_-).$$

Correlated errors are allowed if joint coverage is certified. Algebra supplies no statistical coverage. If a positive lower support bound cannot be established, this argument supplies no finite upper action bound.

Given an independently calibrated absolute reconstruction with $\|x-\hat{x}\|\le\delta$, the triangle inequalities give

$$\max(0,\|\hat{x}\|-\delta)^2 \le a \le (\|\hat{x}\|+\delta)^2.$$

Map error, readout error and unobserved-mode leakage belong in δ. Choosing a unit ray representative is not independent physical support calibration.

6. Exact verification and its limits

The verifier constructs all 15 oriented nonempty simplices of the filled tetrahedron and the boundary d. Exact rational checks give $d^2=0$, $A=d-d^T$, $A^3=-4A$ and active projector $P=-A^2/4$ of rank 14. Hence $J=A/2$ has $J^2=-P$, becoming -I on the active sector.

A synthetic rational two-plane apparatus fixture checks the intertwiner, energy pullback and energy conservation. Five positive rescalings preserve the physical trajectory and energy while changing A_0. Rank controls exhibit the missing norm anchor; exact quarter-cycle points distinguish signed and quadratic readouts. Interval corner checks validate the monotone bound. These are constructor mathematical controls, not measurements.

7. Proposed measurement entry requirements

Required record	Purpose
Carrier and active-state domain	Exclude harmonic/unobserved-sector substitution
Energy G and baseline certificate	Identify the measured subsystem energy
Intertwiner and clock map	Connect the actual apparatus to the native flow
Readout law and signed reference	Certify primitive period and ratio ρ
Absolute map or independent support law	Fix a rather than choosing its convention
Joint errors and leakage bounds	Establish positive support and finite action interval
Frozen rule and non-constructor review	Permit a later target-blind empirical score

Record all target dependencies in the calibration chain. Circuit action $\Phi_0 Q_0$ and native A_0 remain distinct until their map is demonstrated. QPB1's identification $\hbar=A_0/2$ and prediction $\eta_A=2/1$ remain quarantined. No physical apparatus, dataset, independent norm anchor or empirical score is admitted here. These are proposed requirements, not a preregistered experiment.

8. Provenance and status

Source: recovered coefficient ledger v0.85, especially Q282-Q288 and O54-O55. SHA-256:

8845ca23e178e043ef0c7bac01be3afba
9cabbefd866c366921387a8ca843aec

Prior proof: native action identifiability, capture 2026-10-21T160300Z-codex-action-identifiability-32b8a1d4. Its known-anchor premise is retained. This manuscript isolates the support factor and clock requirements needed to apply it. Non-constructor review is pending; EXIT-03 remains HOLD; physical promotion is 0.