

INVARIANT — ZeroDrift Validation Brief

Patent pending: U.S. Provisional 63/873,397

Core Claims (measured)

- Machine-precision conservation: $dH_{rel,max} = 1.11e-16$ (double precision limit).
- Baseline vs ZeroDrift: Baseline drift ~ 0.976 (loss), ZeroDrift drift = 0.000.
- Deterministic replay: psi-replay error = 0.0 (bit-exact reproducibility).
- Stability: largest Lyapunov $\lambda \sim -1.0e-6$ (non-divergent).
- Live topology morphing: chain \rightarrow strong \rightarrow ring \rightarrow grid with exact conservation.
- Throughput ~ 513 samples/s; median step latency ~ 1.625 ms (classical hardware).

Public Artifacts (open inline)

Paper (PDF)	/papers/Zero_Drift_Neural_Computation.pdf
Canonical Proof (JSON)	/proof/canonical_run_proof.json (append ?v=1 if cached)
Figures	/figures/energy_vs_step.png, /figures/topology_schedule.png, /figures/psi_replay.png
Validation Hub	/validation/

Independent Verification Protocol (no engine code needed)

- Energy: Load canonical_run_proof.json; compute $dH_{rel}(t) = |H(t) - H_0|/H_0$. Verify $\max(dH_{rel}) \leq 1.2e-16$.
- Baseline: Confirm baseline_rnn_drift ~ 0.911 (JSON) and ZeroDrift drift = 0.000.
- Determinism: Confirm psi_replay_error_max == 0.0; reruns match bit-for-bit.
- Stability: Confirm lyapunov_max ≤ 0 .
- Coherence (order parameter): $r_{mean} \sim 0.962$ (+5.4% order). This is mesoscopic coherence, not global entropy.
- Topology morphing: topology_sequence = [chain,strong,ring,grid] with H_0 constant at swap points.

Optional JSON check (Python, 5 lines)

```
import json,urllib.request; d=json.load(urllib.request.urlopen('https://invariant.pro/proof/canonical_run_proof.json'))
m=d['metrics']; assert m['psi_replay_error_max']==0.0 and m['lyapunov_max']<=0
print('dH_rel_max:',m['dH_rel_max'],'baseline_drift:',m['baseline_rnn_drift'],'r_mean:',m['r_mean'])
```

NDA & ProofKit

Full ProofKit (procedures, extended logs, replay script) available under NDA. We can run a 45-minute live verification and provide artifacts for your internal lab.

Contact

Jason Volk — jason@invariant.pro — <https://invariant.pro/validation/>

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