

CEDA Calibration Test 002 — Completed Run

Model: Starobinsky Inflation ($R + R^2$)

Audit ID: CAL-002

Role: Positive baseline / gold-standard control

Run Validity Gate

All gates satisfied.

- Model Card: complete and explicit
CAL-002 CEDA Model Card — (Star...)
 - A0 Admissibility: fully declared (frame equivalence, EFT regime, conservation)
 - Translation Card: high-confidence, essentially unique mapping
CAL-002 - Translation Card
 - No forbidden moves detected (no horizon agency, no entropy-as-driver, no hidden closures)
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Diagnostic Results

D1 — Horizon Reconfiguration Null

Result: N/A (Not invoked)

Reason: The model does not claim horizon- or accessibility-only generation of acceleration.
Inflation arises from intrinsic dynamics at the action level.

D2 — Coarse-Graining Stability

Result: PASS

Evidence:

- Inflationary behavior persists under:
 - Jordan \leftrightarrow Einstein frame reformulation
 - Modest EFT cutoff variation within validity
 - No privileged slicing or horizon definition required
 - No order-unity change in $w+1$ under admissible variation
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D3 — Exchange-Term Provenance

Result: PASS

Evidence:

- No exchange terms introduced
 - No partition-motion-induced QQ required to sustain acceleration
 - Stress-energy fully derived from the action (or equivalent scalaron EOM)
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D4 — Predictive Wedge

Result: PASS

Evidence:

- Distinct operational content (e.g., scalaron mass scale, reheating behavior, perturbation predictions)
 - Not a relabeling of Λ or bookkeeping inflation
 - Reduces functional freedom relative to arbitrary $w(t)w(t)$
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Equivalence & Coupling Checks

- **E0 (Equivalence vs Enrichment):**
 - ✓ Jordan–Einstein mapping is invertible and preserves solution space
 - ✓ No new free functions introduced
 - **C1 (Coupling Provenance):**
 - ✓ R^2 term is EFT-controlled
 - ✓ Functional freedom reduced, not expanded
 - ✓ Predictive compression relative to free equation-of-state models
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Ambiguity Budget

All recorded ambiguities (frame choice, EFT cutoff scale) are:

- Physically admissible
- Diagnostic-irrelevant
- Do **not** trigger branching

Verdict stability confirmed.

Final Diagnostic Classification

Stable Mechanism (Positive Baseline)

Acceleration provenance: intrinsic gravitational dynamics

Negative pressure location: higher-curvature sector / scalaron potential

Bookkeeping dependence: none detected

This model cleanly passes CEDA **because** it earns its dynamics, not because it is inflationary.

Why CAL-002 Matters

Calibration 002 establishes that:

- CEDA does **not** penalize inflationary physics
- Frame changes \neq mechanism changes
- Genuine dynamics survive coarse-graining pressure
- The framework correctly recognizes a gold-standard case

In other words: the instrument is behaving.