

CED-007 — CEDA DIAGNOSTIC REPORT (CEDA v0.1)

Summary Verdict

Verdict: AMBIGUOUS (scheme/state fragile; regime-limited).

This is **not** a “math is wrong” claim. It’s a provenance/stability classification: the paper’s central late-time claims lean on structures the authors themselves flag as **not controlled** (counterterm ambiguity in key regimes, vacuum/state issues, and missing resummation).

Key Findings (max 3)

- The paper **explicitly claims** secular growth at special constant- ϵ values and Λ **screening** leading to no Λ -dominated late-time phase in their toy model.
Implications of the graviton on...
 - The authors also explicitly warn that **reliability breaks** in the regimes where the effect matters most (ϵ not constant; perturbation theory / predictability issues; counterterm dependence; need for resummation; state not remaining vacuum).
Implications of the graviton on...
 - As a result, the claimed “screening/attractor” behavior is **not coarse-graining stable** under admissible variations (scheme/state/approximation sensitivity dominates).
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Provenance of Acceleration / Negative Pressure

Origin: bookkeeping-sensitive effective stress–energy from one-loop corrections (not horizon agency).

Where it appears: quantum Friedmann equations via an effective $(T_{\mu\nu})_{\text{Q}}$ from graviton + scalar vacuum fluctuations.

Implications of the graviton on...

No Forbidden Moves (entropy-as-driver / horizon agency) are triggered by the paper as written.

Diagnostic Test Outcomes

D1 — Horizon Reconfiguration Without Added Dynamics

Result: N/A

By construction, the model introduces loop structure; it's not "horizon-only does inflation."

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D2 — Coarse-Graining Stability

Result: FAIL (scheme/state fragile)

Evidence (author-admitted fragility):

- The paper notes ambiguity from counterterms (especially in regimes where quantum effects matter) and says late-time reliability requires resummation that is not known for gravitons.
Implications of the graviton on...
- They explicitly caution there are regimes where ϵ is **far from constant** and results shouldn't be trusted there.
Implications of the graviton on...
- They warn the system near poles will typically **not** be in the assumed vacuum; excited states and mode mixing could significantly change results.
Implications of the graviton on...

This hits your pre-declared D2 failure criteria: dominant scheme/state dependence + loss of robustness without retuning.

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D3 — Exchange-Term Provenance

Result: PASS (within declared regime), but CONDITIONAL

Evidence:

- The effect is presented as coming from a computed one-loop effective action / quantum Friedmann equations (i.e., not inserted as a goal-seeking exchange term).
Implications of the graviton on...

Why conditional: the “effective fluid” interpretation inherits the same scheme/state/resummation problems flagged above, so provenance is “earned” at the formal level but not stabilized at the physical/observational level.

Implications of the graviton on...

C1 — Coupling Provenance & Redundancy

Result: FAIL (functional freedom / degeneracy risk)

Evidence:

- They explicitly use a scalar field with an “appropriate choice of potential” to mimic **any mixture of fluids** relevant for cosmology. That’s maximal flexibility at the background level.
Implications of the graviton on...

Even if the loop correction has structure, the surrounding setup can emulate many histories, so predictive compression is not clearly paid.

S1 — Scheme / State Dependence Classification

Classification: S1-D (scheme-fragile)

Evidence:

- Counterterm ambiguity and unknown resummation dominate critical conclusions; vacuum/state assumptions are explicitly threatened by mode mixing near poles.
Implications of the graviton on...

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D4 — Predictive Wedge

Result: N/A (not reached)

Per your Diagnostic Card, D4 only runs if core claims survive D2 and D3 robustly within regime. D2 fails, so D4 is not applied.

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Conditional Verdict Symmetry Tag

Applied. Mechanism credit is limited to the **declared constant- ϵ , perturbative one-loop regime**. The stronger cosmological claims (global Λ screening; attractor statements) are **not earned** beyond that.

Implications of the graviton on...

What would need to be true to change the verdict

Non-speculative requirements (i.e., “show your work” hurdles):

1. **A controlled resummation** (or equivalent nonperturbative control) demonstrating the secular effects persist and stabilize at late times for gravitons.
Implications of the graviton on...
2. Demonstrate **scheme robustness**: the claimed screening/attractor behavior is invariant (within bounds) under admissible counterterm/renormalization choices in the regime of interest.
Implications of the graviton on...
3. Handle **state evolution** explicitly: show conclusions are not an artifact of assuming a vacuum when mode mixing implies excitation near the pole.
Implications of the graviton on...
4. Extend beyond constant ϵ in a controlled way (or bound the error) since the authors themselves flag ϵ non-constancy in relevant regimes.