

CED-007 — DIAGNOSTIC CARD

Audit ID: CED-007

Paper: *Implications of the graviton one-loop effective action on the dynamics of the Universe*

Authors: Janssen & Prokopec (2008)

Status: Diagnostics declared, **not executed**

Role: Inflation-adjacent quantum backreaction test

Baseline Comparison: MB-2 (Slow-roll EFT), MB-3 (Starobinsky)

Run Validity Gate (RG) — PRE-CHECK

Gate	Requirement	Status
RG1	Model Card complete	✓
RG2	Translation Card complete	✓
RG3	Forbidden moves pre-screen	✓ (none detected at declaration level)
RG4	Diagnostic Card declared	✓
RG5	Null binding acknowledged	✓

RG Status: PASSED (authorization pending)

Diagnostics Requested

D1 — Horizon Reconfiguration Null Test

Requested: Yes No

Justification:

The model does **not** claim that horizon reconfiguration *alone* generates acceleration. Quantum loop structure is explicitly introduced. D1 is therefore **not the primary discriminator**.

Note: D1 may be conditionally revisited if horizon dependence is promoted beyond bookkeeping during D2/D3.

D2 — Coarse-Graining Stability Test

Requested: Yes

Primary diagnostic for CED-007

Admissible variations to test (declared):

- Small variation of coarse-graining scale implicit in coincidence limits
- Alternative admissible vacuum/state choices (where discussed by authors)
- Modest relaxation of constant- ϵ assumption within perturbative control
- Reassignment of near-horizon modes consistent with stated slicing

Failure criteria (pre-declared):

- Order-unity change in effective $w+1w + 1w+1$
- Loss or inversion of claimed screening/acceleration
- Emergence of dominant scheme-dependent terms
- Requirement of retuning to preserve effect

D2 Status: NOT RUN

D3 — Exchange-Term Provenance Test

Requested: Yes

Focus:

- Origin of effective stress-energy $(T^{\mu\nu})Q(T_{\{\mu\nu\}})Q(T^{\mu\nu})Q$
- Whether secular terms function as:
 - derived contributions, or

- implicit regulators controlling duration/outcome

Key questions (pre-declared):

- Are exchange terms strictly derived from loop structure?
- Is conservation closed without auxiliary assumptions?
- Do secular terms regulate inflation/ Λ screening teleologically?

D3 Status: NOT RUN

D4 — Predictive Wedge Test

Requested: Yes (conditional)

Trigger condition:

D4 is applied **only if** the paper's claims survive D2 and D3 within the declared regime.

Wedge sought:

- Operational distinction from Λ + inflation beyond reinterpretation
- Constraint or exclusion not already present in EFT inflation
- Non-degenerate prediction surviving admissible reformulation

D4 Status: NOT RUN (conditional)

Coupling & Scheme Diagnostics

C1 — Coupling Provenance & Redundancy

Requested: Yes

Focus:

- Whether loop-induced structures reduce functional freedom
- Whether secular dependence is equivalent to an implicit $w(t)w(t)w(t)$

C1 Status: NOT RUN

S1 — Scheme / State Dependence Classification

Requested: Yes

Expected classification space (no verdict yet):

- S1-B (state-conditional but physical), or
- S1-D (scheme-fragile)

S1 Status: NOT RUN

Conditional Verdict Symmetry

Enabled: Yes

Rule enforced:

- Mechanism credit only within constant- ϵ , perturbatively controlled regime
 - Extrapolations to late-time attractors or global Λ screening audited **only if earned**
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Ambiguity & Branching Declaration

Known admissible ambiguities (pre-declared):

- Vacuum/state selection
- Handling of near-pole behavior in digamma functions

- Interpretation of scalar field as fluid proxy vs active participant

Branching rule:

- If any ambiguity is both admissible **and** outcome-changing → branching required
 - Verdict defaults to **Ambiguous** if branches disagree
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Diagnostic Integrity Statement

No diagnostics have been run.

No interpretation has been applied beyond faithful translation.

No verdict language is present.

This card declares **what will be tested**, **how**, and **under what constraints** — nothing more.