Translation Card — CAL-002

Audit ID: CAL-002
Paper / Model: Starobinsky Inflation (R+R2R + R^2R+R2)
Auditor: _____
Date: _____

T1. Native Description Summary

The model introduces a higher-curvature correction to the Einstein–Hilbert action. Accelerated expansion arises from intrinsic gravitational dynamics. In an equivalent scalar–tensor formulation, the scalaron rolls on a potential producing a quasi-de Sitter phase.

Primary DOF (as named by authors):

- Metric gμvg_{\mu\nu}gμv
- Curvature scalar RRR (action-level)
- Scalaron ϕ\phiϕ (Einstein-frame reformulation)

Claimed mechanism (1–2 sentences):
Inflation is generated by the dynamics associated with an R2R^2R2 term (or equivalently a scalar field with a fixed potential), yielding negative pressure without horizon agency or phenomenological exchange terms.

T2. Degrees of Freedom Mapping

Native DOF	CEDA Classification	Dynamically Accessible?	Notes
gμvg_{\mu\nu}gμv	Intrinsic dynamical DOF	Yes	Standard GR DOF
RRR	Action-level effective variable	Yes	Not independent from metric
Scalaron ϕ\phiϕ	Equivalent intrinsic DOF	Yes	Emerges via invertible reformulation

Matter fields	Subdominant / neglected	No	Explicitly assumed negligible during inflation

Interior DOF: metric + scalaron (equivalent description)
Traced out: UV completion, higher-order curvature operators beyond truncation
Effective/emergent: scalaron (declared equivalent, not new)

T3. System–Environment Partition

Interior domain: FRW spacetime + inflationary DOF within EFT regime
Environment: UV physics beyond EFT cutoff; no horizon-defined environment
Justification: Partition arises from EFT validity, not causal accessibility

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T4. Horizon / Boundary Interpretation

Horizon type: None used dynamically
Role assigned:
☑ boundary only
☐ descriptive regulator
☐ dynamical role (flagged)

Time dependence: N/A
Note: No quantities sourcing stress–energy depend on horizon choice.

T5. Coarse-Graining Interpretation

Scale(s): EFT cutoff μ\muμ (renormalization scale)
Averaged / traced out: Modes above μ\muμ; UV completion
Held fixed: Conservation structure; action-level couplings

Declared or inferred?
☑ Explicitly declared by authors (EFT truncation)

T6. Exchange-Term Mapping

Exchange terms present? ☐ Yes ☑ No

Notes:
No QQQ terms appear. No partition-induced exchange is required to sustain acceleration.

T7. Translation Confidence

☑ **High** — Mapping is essentially unique and invertible (Jordan ↔ Einstein).

Ambiguity Budget — CAL-002

ID	Translation Element	Competing Interpretations	Physically Admissible?	Affects Diagnostics?
A-01	Frame choice (Jordan vs Einstein)	Curvature-driven vs scalaron-driven language	Yes (declared equivalent)	No
A-02	EFT cutoff choice μ\muμ	Small variation within validity	Yes	No

Assessment:
No admissible ambiguity alters conservation accounting, introduces exchange terms, or relocates acceleration provenance.

Branching Rule Check

- Any admissible ambiguity that could change D1–D4 outcomes? **No**
- **Branching required? No**
- **Verdict stability:** Expected **stable**