Appendix A: Conditional Predictions and Falsifiability

Version 2.0 · 15 September 2026 · Companion to the O049 / checkpoint-060 preprint

A1. What is and is not a prediction here

The established publication status is SCIENTIFIC FEASIBILITY GO = TRUE in the local Variant-B/O049 scope. AP1_GO = FALSE. The corrected θ-source Ward test passes at k = 1, while the complete quantitative response is RAW_RESPONSE_EVALUATOR_METHOD_LIMIT. No new observational curve or empirical test is supplied by this appendix. [E01-E05]

The previous Appendix A v1.0 and its v1.1 overlay proposed expansion/growth/lensing, filament and gravitational-wave research channels. This version preserves those topics as conditional targets. It replaces their old immediate execution framing with the actual 060 evaluator boundary. It does not announce a completed prediction, a newly derived signal or an authorization to start a production calculation. [B01]

There are three different kinds of test:

Kind	Example	What a result would mean
Internal consistency check	Exact state binding, paired-data contact count, stored Ward inequality	Consistency of the stated construction in its declared scope
Quantitative model computation	Complete accepted O049 response with uncertainty and reference	A computed model quantity; not yet an observational detection
Empirical prediction test	A frozen observable compared with designated independent data	Evidence concerning that specific quantitative model claim

A stored Ward bound belongs to the first category. It must not be presented as a measured cosmological signal. The null raw-response fields mean unevaluated quantities, not a prediction of zero response.

A2. Current dependencies

The immediate dependency is a complete executable response package with uniform source/N1 evaluation, once-counted contacts/DC1, a complete error/reference plan and a finite cost bound. The 060 single-time route is not production-ready. Its algebraic reformulation alone does not release the following observational channels. [E03, E05]

The original AP1 completion obligations also include broader stability and the own physical M1 early-to-present connection. Quantitative prediction release follows those relevant obligations. The earlier AP2/AP3 roadmap dependencies remain prospective: no AP2 numerical release is inferred from local feasibility, and AP3's common model basis is not supplied by merely assigning it a label. [E01-E03, B01]

A3. Prospective channel register

P060-01. Joint expansion, growth and lensing

Status: conditional research target; no released template.

The inherited target is a jointly derived vector such as H(z), w_ap(z), fσ8(z), and scale/redshift-dependent effective-gravity, slip and lensing functions. In this appendix η_slip denotes a possible future slip function, to avoid confusing it with conformal time η. The historical roadmap notation is not a computed definition for the present O049 release.

Before a test, the model must supply the physical time/redshift relation, compatible scalar dynamics, complete quantitative response, required stability control, common parameter basis and uncertainties. Definitions and normalizations of every observable must be fixed explicitly. Background, growth and lensing may not be independently retuned and then described as a joint prediction.

The earlier candidate channels include distance measurements, redshift-space growth and lensing. No catalog, data cut, noise model or numerical decision threshold is newly chosen here. A future test would reject its frozen quantitative claim if the specified joint comparison failed under its predeclared rule. Inability to construct the required theory output is a derivation/acceptance failure, not a measurement of a wrong curve. [B01; current limitations E01-E03]

P060-02. Filament residual gravity

Status: conditional hypothesis; dependent on the common physical model basis.

The inherited idea is to derive a residual lensing/dynamical profile around filaments, with radial, redshift and node-distance dependence, after the designated ordinary-matter and comparison-model reconstruction. The template must come from the same accepted parameter basis; its sign, amplitude, shape, environment dependence and nuisance treatment cannot be selected after looking at the target residual.

The historical roadmap includes void and randomly rotated-axis controls. They remain proposed controls, not completed tests. A null residual would reject a future frozen nonzero-residual claim only if that claim and the data's resolving power made such a rejection applicable. A merely unspecified filament hypothesis has no numerical amplitude to exclude. No Apeiron filament detection is claimed at 060. [B01]

P060-03. Gravitational-wave propagation

Status: conditional hypothesis; no released tensor observable.

The inherited target concerns a derived relation between gravitational-wave and electromagnetic luminosity distances, and any justified polarization or line-of-sight dependence. It requires a defined tensor sector, its stability and causal bounds, and the same common model parameters.

The old roadmap's c_GW = c statement is an intended survival condition of that proposed branch, not a derived 060 result. Likewise, an extra polarization component, damping effect or filament correlation is not presumed to exist. A future version must state whether the model predicts any such effect and quantify it before comparison. No current experimental speed bound or numerical confidence interval is quoted or newly imposed here. [B01]

P060-04. Single-carrier interpretation and other motivations

Status: interpretive hypothesis outside the established local result.

Ordinary matter and dark-sector-like phenomena may be discussed as possible organizations or states of one carrier. Genesis, Higgs/QCD interpretations and black-hole reconversion remain motivations outside the O049 result. The older separate-branch reconversion GO is archived; it is not carried as a new claim in this 060 appendix.

A flexible ontological interpretation alone does not supply a falsifiable numerical prediction. To test it through a concrete realization, the model needs observables that restrict what could occur and a stated failure rule. The discovery of an additional particle would not by itself be a test of an unspecified carrier interpretation. No new particle prediction or reconversion rate is made. [B01; scope E03, E09]

A4. Inherited freeze requirements for a later empirical release

Freeze item	Required content	At 060
Model	Equations, conventions, accepted physical scope	Local contract supplied; observational completion open
Shared parameters	Values/ranges, rationale and calibration role	No new observational parameter set supplied
Observable definitions	Units, normalization, coordinates and transfer rules	Proposed channels only
Templates	Fixed grids, interpolation, uncertainties and reference checks	No numerical templates
Data design	Catalog versions, masks, cuts, calibration/heldout split and controls	Not chosen by this release
Statistics	Comparator, likelihood, nuisance policy and decision rule	No new threshold
Freeze record	Version and content hashes before designated comparison	Current editorial hashes do not freeze future curves

These are inherited prospective safeguards, not extra immediate numerical demands added to local feasibility. A later change to a frozen prediction creates a new version; it cannot retroactively rescue an already failed test. No three separately retuned successes may be combined into a claimed common-parameter confirmation. [B01]

A5. Classification of future outcomes

Internal physical NONPASS requires a demonstrated violation of an applicable physical acceptance condition for the actual model and scope. **METHOD_LIMIT** means the chosen evaluation has not established a decision. **Empirical rejection** requires an actual frozen quantitative prediction, designated data and the predeclared comparison rule. The labels are not interchangeable.

The immediate status remains method-limited quantitative response, with inherited local feasibility and θ-source Ward PASS. A complete accepted response would be progress toward later predictions; it would not automatically close extended stability, cosmological mapping or empirical validation. [E01-E05]

A6. Version relationship

Appendix A v1.0 and v1.1 remain byte-preserved inside B01. Their old instructions to begin an AP1 observational block, older statuses and separate branch declarations are superseded as current-facing guidance by this appendix. Their research channels and anti-retuning logic survive as explicitly conditional proposals.

This version supplies no new scientific numerical claim, external data result, observational preference, first-discovery assertion or expansion of the audited 060 scope.