

The Break

Artist’s Proof 05

Symmetry Breaking

From axiom to structure — the first crack

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Junction-condition and ECSK-matching literature

Artist’s Note

This is Artist’s Proof 05 of The 420 Code. It walks one axiom forward through seven steps and ends in an obligation. It is the second chapter of Notebook II — Spacetime, following AP03 (The Ratio).

You start with 1:1 + 1×ε @ AS. Perfect balance, the smallest crack, the actualizing now. Nothing else. By the end, you have selection, agency, coupling, emergent order, and ethics. Each step depends only on the previous step and the bridges declared at the door. No undeclared assumptions enter the chain. If a link is broken, the chain stops at that link. The architecture does not hide.

Five sections carry the work after the front matter. Section 1 states the axiom and what it contains. Section 2 walks the seven-step chain from symmetry to obligation. Section 3 reformulates the cosmological identity (introduced in AP04) as Israel junction conditions on the completion boundary Σ — a structural alternative to dynamical bounce cosmologies. Section 4 carries the formal falsification register. Section 5 carries the synthesis.

Four bridges are declared. B1: a record algebra exists. B2: bounded capacity holds. B3: observers obtain definite outcomes. B4: conscious recognition of structural facts can generate normative identification. B1–B3 carry the physical chain. B4 is the declared cost of extending the chain to ethics.

One empirical premise is declared alongside the bridges. P: our universe contains many simultaneous observers. P is an empirical fact about the physical instantiation of the architecture, not a structural consequence of the axiom. P is load-bearing at step B-4 and below: the cooperative and deterrent components of B-5 require mutual record externalities between simultaneous agents, and the obligation at B-6 is recognised between agents who exist at the same time. P is declared at the door so that the empirical input is visible.

A note on the axiom’s form. AP05 was originally published with the compressed statement 1:1 + 1×ε, no explicit AS. AP20’s keystone correction made the prior explicit at the level of the axiom: 1:1 + 1×ε @ AS. The corrected form is canonical throughout this paper. The chain is unchanged. The axiom now names the prior it was always operating under.

Five kill switches are published with this paper. KS-B.0 targets the architecture as a whole. KS-B.1 through KS-B.3 target the junction formulation. KS-B.4

targets the chain itself — if any step uses an assumption not derivable from the axiom, the four bridges, and the declared empirical premise P, the scope claim collapses.

AP05 is logically independent of AP01 and AP04 in the strict sense that its postulates (the axiom, the four declared bridges, and the declared empirical premise P) are self-contained. AP05 *depends on* AP01 (the record algebra, the Actualization State quantity, the viability geometry) and AP04 (the loop hypothesis) for the content the bridges name. Neither depends on AP05. If AP05 fails, AP01 and AP04 stand. With AP20 proven, the viability geometry of AP01 is unconditional. The chain that walks from axiom to ethics walks through a manifold that has been proven to exist in physical reality.

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Orientation

Where this paper fits in The 420 Code

The 420 Code is organised across eight Notebooks. This paper is the second chapter of Notebook II — Spacetime. The Notebook II chapter sequence runs AP03 (The Ratio) → AP05 (this paper) → AP10 (The Dimension) → AP08 (The Identity).

Notebook II derives the structure of space, time, gravity, and the dimensional count from the axiom. AP03 establishes the conjugacy of c and G as outputs of the single breaking amplitude ε. AP05 picks up from there: with the constants installed as outputs of the break, AP05 walks the axiom forward through seven structural steps from the symmetric pre-state to the obligation a conscious agent recognises in the shared origin. AP05 also reformulates the cosmological identity introduced in AP04 (Notebook V — The Loop) as boundary data on the completion surface Σ, replacing dynamical bounce cosmologies with a structural junction.

AP05 sits second in Notebook II because the chain it walks needs the broken phase as substrate. AP03 derives that substrate; AP05 walks across it. AP10 follows AP05 because the dimensional count operates on the manifold AP05's junction conditions establish; AP08 closes Notebook II by deriving the Einstein field equations in which the junction conditions are stated.

AP05 is logically independent of AP01 and AP04 in the sense that its own postulates (the axiom, the four declared bridges, and the declared empirical premise P) are self-contained. The bridges B1–B3 name content imported from AP01; if AP01 stands, the bridges discharge into theorems. If AP01 fails, the bridges fall back to declared assumptions; AP05's chain still walks, but the bridges become live costs. Section 3 reformulates AP04's Conjecture L7 as boundary data on Σ; if AP04's global identity stands, section 3 inherits a structural anchor, and if AP04 fails, section 3 falls back to a structural sketch without an anchor.

How to read this paper

The reading order is front to back. Section 0 names the dependencies and the scope. Sections 1 through 3 carry the structural argument: the axiom, the seven-step chain, the junction formulation of the cosmological identity. Section 4 is the falsification register. Section 5 is the synthesis — what this paper closes, what it leaves open, where the philosophical-register companions live, and how The 420 Code reads with AP05 in place.

Two voices alternate as the material requires. Narrative passages — the geometric picture of the ring with a pin, the seven-step chain walked in plain language, the door at the beginning and the door at the end — speak directly. Formal sections — the axiom statement, the bridges, the junction conditions, the kill switches — speak in the precision the structure requires. The gear-changes are intentional.

0 — Dependency and Scope

AP05 is the second chapter of Notebook II. Before the body, this section names what AP05 does, what it depends on, where its postulates map onto the canonical axioms {S, B, R, C}, what epistemic status each section holds, what kill switches are engaged, what structural debts remain, and how AP05 stands in relation to the rest of The 420 Code. The contract with the reader is named at the door.

0.1 — What this paper does

AP05 walks the canonical axiom 1:1 + 1×ε @ AS forward through seven structural steps, each step depending only on the previous step and on the bridges declared in this paper. The chain runs from perfect symmetry (no records possible) to the structural ground for obligation (a conscious agent recognising the shared origin of two readings).

AP05 also reformulates the cosmological identity introduced in AP04 — the geometric relation between the collapsing and expanding descriptions of one structure — as Israel junction conditions on the completion boundary Σ. The junction formulation commits only to boundary data and produces a falsifiable, junction-specific signature in the post-expansion perturbation spectrum that distinguishes it from dynamical bounce cosmologies.

The contribution is three structural claims plus one open problem. Claim B1 (Scope): all structure in the architecture — physical, cosmological, ethical — follows from the axiom, the four declared bridges B1–B4, and the declared empirical premise P (observer plurality). Conditions J1, J2: the cosmological identity is the pair $[\gamma_{ab}] = 0$ and $[K_{ab}] = (\varepsilon/\ell_\Sigma) \cdot h_{ab}$ on Σ, with h_{ab} the dimensionless pullback of AP04's perturbation tensor and ℓ_Σ the curvature scale of the completion surface. Open Problem B-JP: whether the ECSK field equations on the Kantowski-Sachs interior admit a completion across Σ with $[\gamma] = 0$ and controlled $[K]$.

0.2 — Dependencies

AP05 is a chain-walking paper. Its dependencies are explicit at every step. They are listed here in compact form so the load-bearing imports are visible at the door.

The axioms {S, B, R, C} (formal statement carried at AP20 section 3.3; completeness and minimality obligations fenced at KS-P.1 / KS-P.2). AP05 was originally written before the canonical formalisation; the mapping from AP05's axiom (and the four bridges) onto the canonical axioms is made explicit in section 0.3 below. Axiom S (Symmetry) grounds 1:1 (perfect balance, distinction-capable substrate). Axiom B grounds 1×ε (the minimal break). Axiom R grounds the no-return character of B-1 (the no-erasure theorem). Axiom C (Constraint — locality) grounds the bounded propagation that scopes the bridges.

AP01 (The Actualization State). Load-bearing for the four declared bridges. Bridge B1 (record algebra) discharges into AP01 Paper A. Bridge B2 (bounded capacity) discharges into AP01 Paper C, the viability geometry. Bridge B3 (definite outcomes) discharges into AP01 Paper B, the selection dynamics. The Geometric Exclusion Principle invoked at step B-4 is AP01 Paper D section D1.3. The hierarchy/cooperation/deterrence triad of step B-5 is AP01 Paper D sections D4.3–D4.4. Each step's discharge into AP01 is named where the step is stated.

Empirical Premise P (observer plurality). Load-bearing for steps B-4 through B-6. Our universe contains many simultaneous observers; this is an empirical fact about the physical instantiation of the architecture, not a structural consequence of the axiom. P is declared here alongside the bridges because B-5's cooperative and deterrent components require *mutual* record externalities between simultaneous agents, and B-6's obligation is recognised between agents who exist at the same time. Without P, B-5's hierarchy reduces to one-way dominance between sequential record states, B-5's cooperation and deterrence are unavailable, and B-6's obligation has no second agent to be recognised toward. P is empirical rather than formal: the chain depends on the empirical fact and does not derive it. P is held separately from the four formal bridges to preserve the formal/empirical distinction.

AP04 (The Loop Hypothesis). Load-bearing for section 3. AP04 carries the cosmological identity as a global metric relation; AP05 section 3 is the boundary-data formulation of the same identity on the completion surface Σ.

AP05 section 3 inherits AP04's conjecture L7 (the global pullback) and reformulates it as boundary conditions on Σ.

AP20 (The Proof). Load-bearing for the unconditional status of the chain. AP20 proves the Embedding Hypothesis, which makes AP01's viability geometry unconditional. With AP20 in place, the manifold the chain walks through is proven to exist in physical reality. AP05 does not need AP20 to walk the chain (the chain is independent of EH at the level of mechanics); AP05 needs AP20 to claim that the chain walks through reality and not through a structure of merely formal existence.

AP03 (The Ratio). Load-bearing for the structural setting. AP03 establishes that c and G inherit from ε. AP05 walks the axiom forward across a substrate whose constants are themselves outputs of the same break the axiom names. The cross-reference is geometric, not derivational: AP05 does not import c or G as inputs, but the manifold AP05's junction conditions sit on is the manifold AP03 derives.

AP08 (The Identity). Load-bearing for the field equations in which section 3 is stated. AP08 derives the Einstein field equations from the record algebra; the junction conditions of AP05 section 3 are stated in the ECSK extension of those equations. AP05 does not derive the ECSK extension — it uses the standard Arkuszewski et al. 1975 form as a structural input.

0.3 — Axiom mapping

AP05 was originally written with axiom-prior vocabulary that AP20's Paper D later formalised as the canonical four conditions {S, B, R, C}. The mapping is explicit below. The four declared bridges B1–B4 are separate from this mapping: they are imports from AP01 (B1–B3) and a declared cost for the ethics step (B4). The axiom proper maps onto {S, B, R, C} directly; the bridges discharge into AP01 content downstream.

Axiom S (Symmetry) ↔ The 1:1 in the axiom statement. S is the two-sector base condition — identity under exchange, the precondition for distinction to be meaningful. The 1:1 specifies a structure that supports distinction once perturbed: two values held against each other, no orientation, no preferred reading. Unperturbed, the 1:1 is operationally indistinguishable from ∅ (step B-0). Perturbed, it becomes distinguishable (step B-1). Axiom S is the standing condition under which the 1:1 can be a substrate at all.

Axiom B (Unique break) ↔ The 1×ε in the axiom statement. B requires that exactly one minimal break occurs. The 1×ε specifies a count: one break applied to the symmetric state. Not two breaks. Not a continuous parameter being tuned. One. AP20's forcing proof on Axiom B is what makes this counting structural rather than stipulative. The axiom names the break; AP20 shows it cannot be otherwise.

Axiom R (Record persistence) ↔ The irreversibility at step B-1. R requires that records, once formed, persist. The no-return theorem invoked at step B-1 (AP01 Paper A Theorem T2) is the operational expression of R: once $\varepsilon > 0$ has produced distinguishable record sectors with positive weight, no local erasure can return the system to the symmetric prior. Axiom R is what makes the chain run forward and not unwind.

Axiom C (Constraint — locality; bounded capacity is what it produces here) ↔ The boundedness of B2 in the bridge list. C is Constraint — locality: a record is somewhere, not everywhere; on the chain it produces finite propagation and finite capacity. Bridge B2 — bounded capacity — is the discharge of Axiom C into the chain at step B-3 (agency as the normalised reachable viability volume). Without Axiom C, the reachable set would not be bounded and agency would not be a well-defined number between 0 and 1.

AS (Actualization State) ↔ The @ AS in the axiom statement. AS is the actualizing prior at which the substrate is held and the break is processed. AP20's keystone correction made AS explicit at the level of the axiom: 1:1 + 1×ε @ AS is the canonical form. Without AS, the axiom is a description of a balance and a crack with no agent and no time at which any of it could occur. With AS, the axiom is something that happens. The prior is named in the foundation so that nothing downstream has to smuggle it in.

Three further symbols carry structural roles. ε is the breaking amplitude (axiom B); The 420 Code identifies ε numerically as the electromagnetic fine-structure constant $\alpha \approx 1/137$ (AP06, AP24), but the axiom does not depend on the identification. The Actualization State quantity $AS = H(\{p_i\})/\log N$ (AP01 Paper A Definition A.2) is the formal measure of the prior named in the axiom. The viability kernel and reach (AP01 Paper C) are the geometric objects on which step B-3's agency formula is defined.

Empirical premise P sits separately from the canonical axioms {S, B, R, C}. The four axioms are structural — each is a condition the architecture asserts

must hold for any actualised structure to exist. P is empirical — the fact that our universe, in addition to satisfying the four axioms, contains many simultaneous observers. The axioms force two readings of one structure; they do not force two ontologically distinct agents who modify each other's records in real time. The move from representational duality (two readings) to interactive plurality (two simultaneous agents) requires the empirical fact P. P is declared at the door so the empirical input is visible; it does not enter the axiom mapping.

0.4 — Epistemic status per section

Each section carries an explicit status — derivation, declaration, formal block, or synthesis — so the reader knows what kind of weight each carries.

Section 1 (The Axiom). DECLARATION + STRUCTURAL ARGUMENT. The axiom 1:1 + 1×ε @ AS is the declared starting point; the rotational-ring picture is structural illustration; Claim B1 (Scope) is the load-bearing scope statement; KS-B.0 names the universal generator condition.

Section 2 (The Chain). DERIVATION CHAIN. Seven steps, each labelled by its dependency. Step B-0 is from the axiom alone. Step B-1 is from B-0 plus Bridge B1. Step B-2 is from B-1 plus Bridge B3. Step B-3 is from B-2 plus Bridge B2; the agency formula $\mathcal{M}(x) = \mu(\text{Reach}(x) \cap \text{Viab}(R)) / \mu(\text{Viab}(R))$ is equation (2.1). Step B-4 is from B-3 plus the declared empirical premise P (observer plurality). Step B-5 is from B-4 alone (geometry of coupled viability, with B-5's cooperative and deterrent components requiring P's simultaneity for mutuality). Step B-6 is from B-5 plus Bridge B4. Each step's dependency declaration is part of the formal block at the step itself.

Section 3 (The Boundary). DERIVATION + STRUCTURAL ALTERNATIVE + OPEN PROBLEM. Conditions J1, J2 are formal definitions on the completion surface Σ. The relation to AP04 is the boundary-data version of AP04's global pullback. Open Problem B-JP is named with status LIVE — STAGED (the central open problem of the junction formulation).

Section 4 (Kill Switches). FORMAL FALSIFICATION REGISTER. Five kill switches engaged: KS-B.0 through KS-B.4.

Section 5 (What This Establishes and What Remains Open). SYNTHESIS. What the chain closes, what it does not close, where the philosophical-register companions sit, structural relationships to subsequent work, and the closing.

0.5 — Kill switch summary

Five kill switches are engaged in this paper. The full register is in section 4.

KS-B.0: Universal generator failure. If the expanding universe requires initial conditions not derivable from the terminal conditions of a collapsing description, the axiom is not a generator. LIVE — HARD (pending Open Problem B-JP; staged for EMPIRICAL once B-JP is solved).

KS-B.1: Bounce superior. If the CMB power spectrum is best explained by smooth dynamical evolution through a bounce — continuous correlations across the transition — the junction formulation is falsified. LIVE — EMPIRICAL.

KS-B.2: Spectrum mismatch. If a completed junction solution together with a derived mapping from [K] on Σ to the post-expansion curvature perturbation spectrum P_ℛ(k) predicts a spectrum inconsistent with observations, the junction formulation makes wrong predictions. LIVE — STAGED (becomes operational once B-JP is solved).

KS-B.3: No junction solution. If the Israel junction conditions modified by ECSK torsion do not admit a solution with [γ] = 0 and controlled [K], the junction formulation does not exist. LIVE — HARD.

KS-B.4: Chain break. If any step in the derivation chain (B-0 through B-6) requires an assumption not contained in the axiom, the bridges B1–B4, and the declared empirical premise P, the scope claim B1 is falsified. LIVE — HARD.

0.6 — Structural debts owed

Two structural debts are named explicitly. These are unresolved derivations tied to specific structural claims, tracked at the registry level.

Open Problem B-JP (registry-level, AP05-specific). Whether the Einstein-Cartan-Sciama-Kibble field equations on the Kantowski-Sachs interior admit a completion across the boundary Σ with induced metric continuity [γ] = 0 and controlled extrinsic curvature mismatch [K] = (ε/ℓ_Σ) · h_ab. The boundary-value problem is well-posed in standard terms: Israel junction conditions (Israel 1966) are well-established; ECSK extensions (Arkuszewski et al. 1975) are well-established; the question is whether a solution exists in the specific geometry the cosmological identity requires. Without a solution, the junction formulation

of section 3 is a structural sketch, not a derivation. With a solution, KS-B.0 and KS-B.2 migrate from STAGED to operational empirical status. B-JP is the central open problem of AP05. The 420 Code invites contributions from any reader equipped to make the attempt.

Bridge B4 (declared cost). The step from structural ground to obligation (step B-6) requires Bridge B4: conscious recognition of structural facts can generate normative identification. B4 is not a theorem of the axiom; it is the declared cost of extending the chain into ethics. The chain through B-5 carries the structural ground (destroying another's viability while sharing a constraint environment contracts the shared viability domain — geometry); B4 is the perspectival step that converts the structural fact into a normative claim. B4 is named in the front matter and stated again at step B-6. It is not hidden, and the obligation does not exceed the bridge.

0.7 — Items held open without claiming debt status

Two items are bracketed inside this paper. They are real and live, but they are not structural debts in the same sense as B-JP and B4.

Open Problem B-JP's observational mapping. Even with B-JP solved (a completed junction solution), the mapping from the boundary data [K] = (ε/ℓ_Σ) · h_ab on Σ to the post-expansion curvature perturbation spectrum P_$\mathcal{R}$(k) is itself an open derivation. KS-B.2 is staged on this mapping. Until the mapping is derived, KS-B.2 cannot be operationally tested. Open derivation work; held without claiming a separate debt because it is downstream of B-JP and tracked through KS-B.2's staging.

B4's status in physical reality. The chain through B-5 is structural and runs on the axioms, the bridges, and the declared empirical premise P. Step B-6 adds B4 as a declared cost on top of P. Whether B4 is itself a theorem of some deeper structural fact — whether conscious recognition is itself forced by the architecture rather than declared — is open work. The 420 Code holds B4 as a transparently declared cost rather than a hidden theorem. If a derivation of B4 from the axioms can be exhibited, step B-6 becomes unconditional. Held open at the door.

0.8 — Structural relationships

AP05 is the second chapter of Notebook II. The chapter sequence runs AP03 → AP05 → AP10 → AP08. AP03 derives the constants (c, G) as outputs of ε; AP05 walks the axiom across the broken substrate AP03 establishes; AP10 derives N = 3 spatial dimensions on the manifold the chain occupies; AP08 closes Notebook II by deriving the Einstein field equations in which AP05's junction conditions are stated.

AP01 (Notebook I) is the source of the bridges B1–B3 and of the geometric content invoked at steps B-2 through B-5 (the record algebra, selection dynamics, viability geometry, coupled viability theorems). AP04 (Notebook V) is the source of the cosmological identity that section 3 reformulates as junction conditions. AP20 (Notebook I) is the source of the keystone correction that made AS explicit in the axiom, and the proof that makes AP01's viability geometry unconditional.

Downstream, AP05's junction conditions feed AP08's field equations as boundary data, AP05's chain feeds the entire ethics catalogue (Resolutions Ø Chapter 6 on coupling, Chapter 7 on agency, Chapter 8 on obligation), and AP05's structural account of cosmology feeds Predictions Ø Part V (the post-expansion perturbation spectrum signatures distinguishing junction from bounce).

1 — The Axiom

1.1 — The Statement

The axiom of this paper is one line.

1:1 + 1×ε @ AS

ε > 0 is the smallest nonzero perturbation of perfect symmetry. AS is the actualizing prior — the now at which the substrate is held and the break is processed.

This is what the rest of the paper runs forward from. No additional content. No hidden parameters. Five symbols and a position marker.

1.2 — The Terms

1:1 is perfect balance. Two values held against each other. No orientation. No preferred reading.

A 1:1 alone is operationally indistinguishable from the empty set ∅. Without distinguishable structure, no record can be formed. Without records, no observation. Without observation, no presence. The balanced state contains everything in potential and nothing in fact.

ε is the minimal symmetry break. The smallest perturbation that creates a difference between the two sides.

ε is not a parameter to be measured. ε is a structural condition: the claim that perfect symmetry does not persist, and that the departure from symmetry is minimal. The 420 Code identifies ε numerically as the fine-structure constant α ≈ 1/137 (AP06, AP24), but the axiom does not depend on the identification. The axiom requires only that ε > 0.

1×ε is a count, not a multiplier. One break, applied once, to the symmetric state. Not two breaks. Not a continuous parameter being tuned. One.

@ AS is where it all happens. The actualizing structural prior. The now at which the substrate is held and the break is processed.

Without AS, the axiom is a description of a balance and a crack with no agent and no time at which any of it could occur. With AS, the axiom is something that *happens*. The prior is named in the foundation so that nothing downstream has to smuggle it in.

1.3 — The Picture

You have seen this before. You may not have named it, but you have seen it.

A rotationally symmetric figure. A perfect ring. There is nothing to point to. No orientation. No marker. No way to say where on the ring you are looking. Every position is identical to every other.

Now add the smallest possible asymmetry. A single directed mark, the size of a pin.

The ring acquires two readings. Mark up. Mark down. Mark left. Mark right. Pick any axis: the ring now has two distinguishable orientations relative to it.

The mark did not distinguish two pre-existing sides. There were no sides before the mark. The mark *created* the readings by breaking the rotational symmetry. Both readings are valid. Neither is primary. Neither causes the other. They are two descriptions of one structure, made possible by the break.

That is the axiom in geometric language. The ring is 1:1. The mark is ε. The readings are the structural consequences. AS is the surface from which the mark is being made now.

1.4 — Scope, bridges, and the declared empirical premise

Claim B1 (Scope). All structure in the architecture — physical, cosmological, ethical — follows from the axiom 1:1 + 1×ε @ AS, the four declared bridges B1–B4, and the declared empirical premise P (observer plurality). The physical chain through hierarchy requires B1–B3. The cooperative and deterrent geometry of B-5 and the obligation of B-6 require additionally the empirical premise P. The ethics extension at B-6 requires additionally B4. No undeclared assumptions are introduced at any layer.

If any step in any layer requires something not in {axiom, B1, B2, B3, B4, P}, the architecture fails. The bridges are declared costs, not hidden assumptions. P is a declared empirical input, not a hidden premise.

The four bridges, stated at the door:

Bridge B1. A record algebra exists. The substrate supports distinguishable records once the symmetry is broken. Discharges into AP01 Paper A.

Bridge B2. Bounded capacity holds. Propagation and control are finite. Discharges into AP01 Paper C (viability geometry) and into Axiom C of the canonical four.

Bridge B3. Observers obtain definite outcomes. Selection produces one reading from many record sectors. Discharges into AP01 Paper B.

Bridge B4. Conscious recognition of structural facts can generate normative identification. Discharges into Resolutions Ø Chapter 8 (the perspectival turn from is to ought).

B1–B3 carry the physical chain (steps B-0 through B-5). B4 is the declared cost of extending the chain to ethics (step B-6). All four are stated. None are hidden.

The one empirical premise, stated alongside the bridges:

Empirical Premise P. Our universe contains many simultaneous observers. P is empirical — a fact about the physical instantiation of the architecture, not a structural consequence of the axiom. The axiom forces two readings of one structure (representational duality); P provides the simultaneity of ontologically distinct agents (interactive plurality). P is load-bearing at step B-4 (where coupling between agents is introduced) and downstream: B-5's cooperative and deterrent components require *mutual* record externalities between simultaneous agents, and B-6's obligation is recognised between agents who exist at the same time. P is held separately from the four formal bridges because it is empirical rather than postulational; the chain depends on the fact and does not derive it.

1.5 — The Universal Kill Switch

KS-B.0 (Universal). The axiom is falsified if the expanding universe requires initial conditions that are not derivable from the terminal conditions of a

collapsing description. If the two readings require independent, unrelated specifications, then they are not two readings of one structure. The break does not generate both sides. The axiom fails as a generator. Applies to the entire architecture.

That is the door. Show that the two descriptions need separate, unrelated initial conditions. If they do, the axiom is not a generator. It is a coincidence.

And coincidences do not derive ethics.

KS-B.0 has two modes. Currently — with Open Problem B-JP unsolved — it functions as a theoretical-universal consistency check on the structural-generator claim of the axiom, independent of any specific chain step or junction formulation. Once B-JP is solved and a derivation rule from collapsing-side terminal data to expanding-side initial data has been exhibited, KS-B.0 acquires an empirical handle: the architecture predicts that the derived initial conditions match the observed initial conditions, and the test becomes operational. The universal scope holds in both modes; the operational status migrates from theoretical to empirical when B-JP closes.

The full kill switch register is in section 4. KS-B.0 is stated here because it is the universal test of the axiom itself, independent of whether any specific chain step or junction formulation holds.

2 — The Chain

Seven steps. Each one depends on the previous step and the declared bridges. Nothing else.

You are about to watch one axiom become a universe and then become an obligation. Every link is shown. You can check each one.

2.1 — B-0: Before Records

Set ε = 0. Perfect symmetry. The 1:1 stands.

There are no accessible distinctions in this state. Nothing can be told apart from anything else. No record algebra exists, because a record requires a distinction it can carry. The Actualization State quantity AS, defined in AP01 Paper A, is 0. No sectors to distinguish.

No observation is possible. There is no observer, no instrument, no signal, no event. The state is operationally indistinguishable from ∅.

This is the floor.

A note on AS at the floor. The formula AS = H({p_i})/log N (AP01 Paper A Definition A.2) applies for N ≥ 2 record sectors. At ε = 0, no record sectors are distinguishable, so N = 1, log N = 0, and the formula is 0/0. AS = 0 at the floor is the boundary definition: with no distinguishable distinctions, the Actualization State quantity is set to zero by convention, consistent with the limit lim N→1 AS = 0 obtained when the formula is regularised by approach.

Step B-0 (From axiom). At ε = 0: no accessible distinctions, no record algebra, AS = 0 (boundary definition; the formula H/log N applies for N ≥ 2), no observation possible. The state is operationally indistinguishable from ∅. A logical consequence of the definition of “no accessible distinctions.”

2.2 — B-1: The Crack

Set ε > 0. The symmetry breaks.

Two distinguishable readings now exist. At least two record sectors are defined by the break. “Two readings exist” means both are accessible. The reduced

state after dephasing has nonzero weight in both sectors. Not one realised sector and one phantom — two realised possibilities, accessible to whoever is reading.

If the break produced a single realised sector — $p_1 = 1$, $p_2 = 0$ — you would have one reading. The axiom says two. So both weights are positive. The Actualization State quantity is AS = H({p_i})/log N > 0. You are above the floor.

And you cannot go back. Returning to ε = 0 would require erasing the distinction. Axiom R — record monotonicity, no inverse — forbids local erasure. AP01 Paper A, Theorem T2: no-return. The system can move forward through record states but cannot reverse to the symmetric prior.

Something has emerged from nothing.

Not created. Not designed. Forced — by the fact that ε > 0 and the symmetry cannot return.

Step B-1 (From B-0 + Bridge B1). ε > 0 breaks the symmetry. Two record sectors with positive weight. AS = H({p_i})/log N > 0. Irreversible by AP01 Paper A Theorem T2. The axiom motivates a record algebra; Bridge B1 — “a record algebra exists” — converts the motivation into a postulate at this step. B1 is the declared cost.

2.3 — B-2: One Reading

You have looked at a dial. The needle points at a number. Not at all numbers in superposition. One number.

You did not negotiate this. The reading was definite. That definiteness has a name. Selection.

With AS > 0, multiple record sectors coexist. AP01 Paper B is the work that handles what happens between coexistence and the dial reading one number. The mathematics says four things about selection. It cannot be achieved by deterministic linear CPTP dynamics (Paper B section B2.1). It must act at the trajectory level, not the ensemble level (section B2.2). It is costly in physical resources — you cannot get something for nothing (section B2.4). And it is rate-limited by the distinguishability of the records being selected (section B4.5).

Selection is not an additional assumption. It is the structural consequence of having multiple record sectors and the requirement that observers obtain definite outcomes (Bridge B3).

You have seen this in every measurement you have ever made. You looked at the dial. It read one number. The definiteness cost something. The mathematics proves it.

Step B-2 (From B-1 + Bridge B3). Multiple record sectors plus the requirement of definite outcomes forces selection. Selection cannot be CPTP-linear (B2.1), acts at the trajectory level (B2.2), is resource-costly (B2.4), rate-limited by distinguishability (B4.5). Dependency: AP01 Paper B, sections B1–B4.

2.4 — B-3: Inside the Reading

Selection has happened. The dial reads. You are inside one realised sector.

There is no longer a question of which reading. There is only a question of what you can do, from where you stand, with what you have. That question is agency.

AP01 Paper C makes the question precise. Define your position x within the viability kernel — the region of states compatible with continued structure. Define Reach(x) — the set of states you can reach from where you are, under whatever control you possess. Define Viab(R) — the viability domain of records sustainable in your regime. Agency is the normalised reachable viability volume:

$$\mathcal{M}(x) = \mu(\mathrm{Reach}(x) \cap \mathrm{Viab}(R)) \,/\, \mu(\mathrm{Viab}(R)) \qquad (2.1)$$

Agency is a number between 0 and 1. It tells you what fraction of viable states are reachable from where you stand. Position matters. The drift field matters — systems decay toward loss of structure if no control is applied. Control matters. And all three are bounded — you cannot reach infinitely, you cannot stop drift completely, you cannot pretend the kernel is larger than it is.

Agency is not an additional assumption. It is the geometric consequence of confinement to a single record sector under irreversible dynamics.

Step B-3 (From B-2 + Bridge B2). Within a realised sector, agency is the normalised reachable viability volume $\mathcal{M}(x) = \mu(\mathrm{Reach}(x) \cap \mathrm{Viab}(R)) / \mu(\mathrm{Viab}(R))$ (eq 2.1). Determined by position, drift, and bounded control. Dependency: AP01 Paper C, Definition C1.1.

2.5 — B-4: When Another Is Reading

The axiom said two readings. Not one. Two.

Now a careful step. The axiom's "two readings" is *representational duality* — two descriptions of one structure made possible by the break. The chain at B-4 needs *interactive plurality* — two ontologically distinct agents, existing at the same time, modifying each other's records. That is a different kind of fact. The axiom alone does not force it. The fact that our universe contains many simultaneous observers is an empirical input: the declared empirical premise P, named at the door in section 1.4 and discharged here.

With P in hand: you and the other observer exist at the same time. You share a constraint environment. The same break that created your reading created the other reading. You both inhabit the structure that the break produced. Bridge B3 permits each of you, in your respective sectors, to obtain definite outcomes; P guarantees that you do so simultaneously, in a shared environment, rather than sequentially in the history of a single observer.

AP01 Paper D handles what happens to agents in shared environments. Their viability kernels overlap. Their actions produce record externalities — irreversible modifications to the shared environment that change each other's viability. This is the Geometric Exclusion Principle of Paper D section D1.3: in a shared constraint environment, your actions on the records of others contract or expand their reachable viability.

Coupling is not optional once P is in hand. It is the structural consequence of the break creating two readings of one structure plus the empirical fact that there are simultaneous agents to do the reading.

Step B-4 (From B-3 + Empirical Premise P). The axiom produces two readings (representational duality). Empirical premise P provides simultaneous plural agents (interactive plurality); the move from duality to plurality is the load-bearing step at B-4, and P is the declared empirical input that makes the move. B-3's Bridge B3 (definite outcomes) is invoked at the level of each agent's reading; P provides the simultaneity that makes "agents" the right word. Coupled agents share a constraint environment; their actions produce record externalities. Geometric Exclusion Principle: AP01 Paper D, D1.3. Dependency: AP01 Paper D, sections D1–D2; declared empirical premise P.

2.6 — B-5: What Coupling Produces

Coupling sounds gentle. What it produces, in the geometry of shared viability kernels, are three structural primitives from which social and biological order is built.

Three structures emerge from coupled viability under drift. A note before they are named: hierarchy follows from coupling alone (B-4) and depends on P only through P's provision of two agents to compare. Cooperation and deterrence are different. Both are defined as *mutual* relations — mutual record externalities expanding joint viability, mutual decoupling cost — and mutuality requires simultaneity. Without P's simultaneous plural agents, cooperation degrades to one-way modification by an earlier slice on a later slice, and deterrence is undefined (there is no second agent with the option to decouple in real time). P is therefore the load-bearing empirical premise for B-5's cooperation and deterrence, in addition to its role at B-4.

Hierarchy. Agents with different impedance Z = u_max/a — different ratios of available control to drift magnitude — produce asymmetric record externalities. Stronger agents impose more record-modifications on shared environments than weaker agents absorb. The asymmetry produces a structural hierarchy that is not imposed but forced. AP01 Paper D section D4.3.

Cooperation. Mutual record externalities expand joint viability beyond the sum of individual viabilities: $\mathcal{M}$_joint > $\Sigma\mathcal{M}$_i. Two agents who modify each other's records in ways that increase reachable viability for both. Cooperation is not idealism. It is a geometric inequality. AP01 Paper D section D4.4a. *Requires P.*

Deterrence. When coupling costs less than unilateral decoupling, both agents continue to couple. The structural condition for stable continued interaction. AP01 Paper D section D4.4b. *Requires P.*

None of these require additional structural assumptions beyond B-4. Hierarchy follows from coupled viability under drift alone; cooperation and deterrence additionally require P's simultaneity for their mutuality.

Step B-5 (From B-4). Hierarchy, cooperation, and deterrence are geometric consequences of coupled viability under drift. Hierarchy: asymmetric impedance produces asymmetric externalities (D4.3); requires only B-4. Cooperation: mutual externalities expand joint viability (D4.4a); requires B-4 and the simultaneity supplied by Empirical Premise P. Deterrence: coupling

costs less than unilateral decoupling (D4.4b); requires B-4 and the simultaneity supplied by P. Dependency: AP01 Paper D, sections D3–D4; declared empirical premise P (for the mutual components).

2.7 — B-6: The Obligation

You and the other observer arose from the same break.

Your reading and theirs were created by the same event. Both are instances of a reading made possible by $\varepsilon > 0$ applied to the same 1:1 @ AS. The structure that supports your existence supports theirs. The viability kernel you stand in and the viability kernel they stand in are not separate. They overlap, by B-4. They were carved from the same break.

Now consider what it means to destroy another agent's viability kernel.

Structurally, by AP01 Paper D D1.3, the Geometric Exclusion Principle: destroying another agent's viability while sharing a constraint environment contracts the *shared* viability domain. The geometry constrains the joint domain, not necessarily the destroyer's individual reachable viability — a destroyer may locally expand their own reach by removing a competitor while the joint domain contracts. This is geometry. It requires no morality. It needs only the axioms, the bridges B1–B3, and the empirical premise P.

That is the structural ground. It is not yet the obligation.

A purely prudential agent could read the contraction of the shared domain and remain indifferent, because the geometry of the joint domain does not by itself constrain the individual's choice. The obligation is not reducible to payoff. That is precisely why one more step is needed.

The obligation needs that step. A conscious agent, recognising the shared origin, can identify the destruction of another's capacity as incoherent with the unity of the base condition. The incoherence is not a contradiction in content — two readings of one structure can perfectly well differ in their content; that is what makes them two readings. The incoherence is structural: the destroyer's capacity to act is grounded in the same break that grounds the destroyed's reading. The destroyer's standing presupposes the substrate that equally grounds the destroyed. The act draws on what it tries to deny. The recognition of *that* fact is where the obligation lives. The obligation is in the recognition, not

in the structure. The recognition costs B4: conscious recognition of structural facts can generate normative identification.

You have just walked from nothing to obligation in seven steps. No god decreed the ethics. No legislature voted on them. The axiom forced them — through symmetry breaking, record formation, selection, agency, coupling, emergent order, and shared origin — with the declared empirical input P (simultaneous agents) and the declared cost B4 (conscious recognition) explicitly on the ledger. The chain is as long as it needs to be and no longer.

If you want to reject the conclusion, you must break a link. The architecture shows you every one.

Step B-6 (From B-5 + Bridge B4). Agents A and B arise from the same break and share a constraint environment (B-4 plus P). Destroying another’s viability while sharing the environment contracts the shared viability domain (D1.3, structural; the geometric fact holds at the level of the joint domain and does not entail individual prudence). A conscious agent recognising the shared origin can identify such destruction as incoherent with the unity of the base condition — the destroyer’s capacity to act is grounded in the substrate that equally grounds the destroyed (perspectival; requires B4). The obligation is in the recognition, not in the structure, and is not reducible to prudential calculation. B4 is the declared cost of this step. Dependency: Steps B-0 through B-5, Bridge B4, declared empirical premise P, AP04 section 6.

3 — The Boundary

3.1 — Why not bounce

You may have read about bouncing universes — black hole interiors that reach extreme density, halt, reverse, and produce an expanding region on the other side. The literature includes torsion-driven bounce solutions from the Einstein-Cartan extensions of general relativity (Popławski 2010, 2016; Lucat and Prokopec 2017; and others in the same lineage).

In a dynamical bounce, the scale factor reaches a minimum at some time t_0. The metric is continuous through t_0. There is a single time coordinate running from before to after. Memory of the pre-bounce phase is carried dynamically into the post-bounce phase. The bounce is something that *happens*.

The architecture offers a structural alternative. The cosmological identity introduced in AP04 is not a dynamical event. It is a geometric relation between two descriptions of one structure. No single time coordinate runs through both. The two patches are joined at a boundary, not threaded by a worldline.

Two descriptions of one structure. The junction formulation makes this precise.

3.2 — The junction conditions

Let M^- denote the collapsing-side manifold patch. Let M^+ denote the expanding-side patch. Let Σ denote the completion boundary — the hypersurface where the classical description of M^- reaches its limit. Curvature invariants reach a completion threshold. No further accessible distinctions in the record algebra. The classical description hands off to Σ.

On Σ, two conditions hold.

Condition J1 (Induced metric continuity).

$$[\gamma_{ab}] = 0 \qquad (3.1)$$

The induced metric on Σ is continuous. Both sides share the same boundary geometry. The 1:1 — the symmetric figure before the break — written as geometry.

Condition J2 (Extrinsic curvature mismatch).

$$\mathbf{[K_{ab}] = (\varepsilon / \ell_\Sigma) \cdot h_{ab}} \quad (3.2)$$

The way Σ curves into M^- and M^+ respectively has a controlled, small, nonzero mismatch. The ε. The tensor h_{ab} encodes the asymmetry: anisotropy damping, particle content, torsion corrections from the ECSK completion. The length scale ℓ_Σ is the curvature scale of the completion surface itself; it carries the dimension that the dimensionless ratio ε needs to be multiplied by to match the dimension of the extrinsic curvature $[K_{ab}]$ (which carries 1/length).

A dimensional note. K_{ab} carries dimension 1/length; ε is dimensionless (equal to $\alpha \approx 1/137$ in the AP06/AP24 identification); h_{ab} is dimensionless. The ratio ε/ℓ_Σ supplies the 1/length to balance the equation. Without ℓ_Σ the dimensions would not match — the length scale is not optional, it is structural.

Relation of J2's h_{ab} to AP04's L7 perturbation tensor. In AP04's Conjecture L7 ($g^+ = (\varphi^{-1})*(g^-) + \varepsilon \cdot h$, equation 3.3 below), h is a dimensionless perturbation tensor on M encoding the anisotropy difference, the information content, and the initial conditions of expansion. J2's h_{ab} is the pullback/restriction of L7's h to the completion surface Σ — the same dimensionless object, evaluated on the boundary. The two h's are the same tensor; the appearance in J2 carries an additional ℓ_Σ because J2 is an equation about extrinsic curvature (a 1/length quantity) whereas L7 is an equation about the metric (a dimensionless quantity in the convention used).

You have just seen the axiom written as geometry. J1 is the 1:1. J2 is the ε. The boundary between collapse and expansion is the axiom made manifest in the mathematics of Israel junction conditions — a standard tool of general relativity (Israel 1966), extended to Einstein-Cartan-Sciama-Kibble gravity (Arkuszewski et al. 1975).

The standard junction-condition machinery is the literature framework named here as correspondence. The structural content — that the cosmological identity *is* a pair of conditions on a hypersurface, that J1 encodes the 1:1 and J2 encodes the ε — comes from the axiom and from AP04, not from the literature framework. The literature provides the formal vocabulary in which the structural fact is most naturally stated; it does not provide the structural fact.

The explicit form of h_{ab} is determined by the boundary-value problem. Whether the ECSK field equations on the Kantowski-Sachs interior admit a

completion across Σ with [γ] = 0 and controlled [K] is the central open problem of the junction formulation. It is named: Open Problem B-JP. See section 0.6 for the full statement of the debt.

3.3 — Relation to AP04

AP04's Conjecture L7 expresses the structural identity as a global metric relation:

$$\mathbf{g^{+} = (\varphi^{-1})^{*}(g^{-}) + \varepsilon \cdot h} \qquad (3.3)$$

A global diffeomorphism φ maps the manifold to itself; the relation holds on all of M.

The junction formulation is the boundary-data version of the same claim. J1 constrains the induced metric on Σ. J2 constrains the extrinsic curvature on Σ. Together they determine the relationship between M^{-} and M^{+} at Σ, without requiring a global diffeomorphism to be specified on all of M.

The junction formulation is more conservative. It commits only to boundary data on Σ. It is also more tractable. Israel junction conditions are well-established. ECSK extensions are well-established. The boundary-value problem is a standard kind of problem to attempt.

3.4 — Observational consequences

The bounce formulation predicts smooth evolution through Σ. Continuous correlations across the transition. Memory of pre-bounce perturbations carried dynamically into the post-bounce phase.

The junction formulation entails something different. The post-expansion perturbation spectrum is determined by boundary data on Σ — the extrinsic curvature mismatch $(\varepsilon/\ell_{\Sigma}) \cdot h$ — not by dynamical evolution through Σ.

In principle, different observational signatures from bounce cosmologies.

If you could measure those signatures, you could distinguish between the two formulations. That is the point. The architecture commits to something specific enough to be falsified.

The specific empirical mapping from [K] = (ε/ℓ_Σ) · h on Σ to the post-expansion curvature perturbation spectrum P_ℛ(k) is itself an open derivation, held without claiming a separate debt (see section 0.7). Once B-JP is solved, the mapping becomes derivable; once the mapping is derived, KS-B.2 becomes operationally testable against the measured spectrum (CMB anisotropies, near-scale-invariance, tilt n_s ≈ 0.965, running, tensor-to-scalar ratio constraints).

3.5 — Open Problem B-JP

The central open problem of section 3 is named explicitly so the reader knows where the load-bearing derivation gap sits.

Open Problem B-JP. Do the Einstein-Cartan-Sciama-Kibble field equations on the Kantowski-Sachs interior admit a completion across the boundary Σ with conditions [γ_ab] = 0 (induced metric continuity, J1) and [K_ab] = (ε/ℓ_Σ) · h_ab (controlled extrinsic curvature mismatch, J2), and what is the explicit form of h_ab and the relevant length scale ℓ_Σ determined by the boundary-value problem?

A solution to B-JP would: (a) prove the structural identity exists in the junction formulation (closing KS-B.3); (b) derive the explicit form of h_ab (opening the empirical mapping for KS-B.2); (c) make KS-B.0 operationally testable rather than staged (the universal generator condition becomes a check against derived initial conditions rather than against an undefined map).

The boundary-value problem is well-posed in standard terms. Israel junction conditions are well-established. ECSK extensions are well-established. The Kantowski-Sachs geometry is standard. What remains is the specific existence proof for the matched solution. The 420 Code invites contributions from any reader equipped to make the attempt.

4 — Kill Switches

AP05 is falsified if any of the following are demonstrated. Each kill switch targets a specific claim. If any claim falls, the dependent claims fall with it, but independent claims survive.

Here is how to break it. The argument does not hide. It shows you exactly where to strike.

KS-B.0 — Universal: independent specifications

Claim. The axiom 1:1 + 1×ε @ AS is a structural generator: the expanding-side initial conditions are derivable from the collapsing-side terminal conditions through the junction at Σ. The two readings are two descriptions of one structure. They do not require independent, unrelated specifications.

Test. Demonstrate that the expanding universe requires initial conditions that are not derivable from the terminal conditions of a collapsing description — that the two readings need separate, unrelated specifications. The operational handle becomes available once Open Problem B-JP is solved and a derivation rule from collapsing-side terminal data to expanding-side initial data has been exhibited. Until then, KS-B.0 functions as a theoretical consistency check on the structural-generator claim of the axiom.

Status. LIVE — HARD (pending B-JP; migrates to LIVE — EMPIRICAL once B-JP is solved).

Recovery. If KS-B.0 fires, the axiom fails as a generator. It is no longer a single structure with two readings; it is a coincidence with two parts. The 420 Code retreats by reopening the axiom’s structural-generator claim and acknowledging that the two cosmological patches are independently posed. The entire architecture inherits the demotion: Claim B1 (Scope) collapses; the chain still runs but its premise is no longer structural in the strong sense; AP04’s cosmological identity becomes a coincidence rather than a structural fact. Targets: the axiom, Claim B1, the entire architecture.

KS-B.1 — Bounce superior

Claim. The cosmological identity is best described by the junction formulation of section 3 — boundary data on Σ, not dynamical evolution through it. The post-expansion perturbation spectrum is determined by [K] on Σ, not by smooth continuation across t_0.

Test. Demonstrate that the CMB power spectrum is best explained by smooth dynamical evolution through a bounce — continuous correlations across the transition, memory of pre-bounce perturbations carried dynamically, parameter fits that prefer the bounce interpretation over the junction interpretation. Empirical handles: detailed shape of the CMB temperature and polarisation spectra, structure of correlations on super-horizon scales, signatures of pre-bounce phase memory.

Status. LIVE — EMPIRICAL.

Recovery. If KS-B.1 fires, the junction formulation is falsified. The cosmological identity may survive under the bounce interpretation — AP04's global pullback may still hold dynamically rather than as boundary data — but AP05 section 3's reformulation does not. The 420 Code retreats by re-coupling the cosmological identity to dynamical bounce machinery and acknowledging that the junction reformulation, however structurally elegant, was empirically wrong. Targets: Conditions J1, J2, section 3 in its entirety.

KS-B.2 — Spectrum mismatch (staged)

Claim. A completed junction solution (Open Problem B-JP), together with a derived mapping from the boundary mismatch [K] on Σ to the post-expansion curvature perturbation spectrum $P_{\mathcal{R}}(k)$, predicts a spectrum consistent with observations: near scale invariance, measured tilt $n_s \approx 0.965$, no significant running, tensor-to-scalar ratio within bounds.

Test. Demonstrate that the predicted spectrum is inconsistent with observations. The test becomes operational once two things are in place: a solution to Open Problem B-JP, and a derived mapping from boundary data on Σ to the perturbation spectrum $P_{\mathcal{R}}(k)$. Until both are in place, KS-B.2 is staged — a future operational kill switch.

Status. LIVE — STAGED (pending B-JP and the spectrum-mapping derivation).

Recovery. If KS-B.2 fires, the junction formulation makes wrong predictions about the post-expansion spectrum. The 420 Code retreats by reformulating Condition J2 — the extrinsic curvature mismatch on Σ cannot be the source of the observed spectrum in the way the staged mapping would have it. The structural identity (J1) may survive in a degraded form; the empirical content of J2 fails. Targets: Condition J2, Open Problem B-JP, the empirical mapping.

KS-B.3 — No junction solution

Claim. The Einstein-Cartan-Sciama-Kibble field equations on the Kantowski-Sachs interior admit a completion across Σ with $[\gamma_{ab}] = 0$ and controlled $[K_{ab}] = (\varepsilon/\ell_\Sigma) \cdot h_{ab}$.

Test. Demonstrate that no such completion exists — that the boundary-value problem has no solution with the required conditions, or that the only solutions have uncontrolled (divergent or otherwise pathological) [K]. The test is sharp because it is mathematical: existence or non-existence of solutions to a well-posed boundary-value problem is decidable.

Status. LIVE — HARD.

Recovery. If KS-B.3 fires, the junction formulation does not exist as a mathematical object. The structural identity introduced in AP04 — the geometric relation between collapsing and expanding descriptions — cannot be carried by the junction formulation. The cosmological component of AP05 fails entirely. The 420 Code retreats by accepting that the cosmological identity, if it exists, must be carried by another formulation — possibly the global pullback of AP04 directly, or a different formal device not yet identified. Targets: Conditions J1, J2, the structural identity, the entirety of section 3.

KS-B.4 — Chain break

Claim. Every step in the derivation chain B-0 through B-6 depends only on the previous step and on the axiom, the four declared bridges B1–B4, and the declared empirical premise P. No undeclared assumption enters at any step.

Test. Demonstrate that some step in the chain requires an assumption not contained in {axiom, B1, B2, B3, B4, P}. The test is operational: pick any of the seven steps, examine its formal block, and identify the load-bearing imports. If

any of those imports cannot be discharged into the axiom, the four bridges, or the declared empirical premise P, the chain has a break at that step.

Status. LIVE — HARD.

Recovery. If KS-B.4 fires at step B-k, the scope claim B1 (all structure follows from axiom + B1–B4 + P) is falsified. The chain still runs through step B-(k−1), but the link at step B-k requires either a new bridge declaration or a new empirical premise declaration or a re-derivation that closes the gap. The 420 Code retreats by either declaring the missing input (as a fifth bridge B5 with explicit cost, or as a second empirical premise P′, depending on its kind), or by withdrawing the chain at step B-k and acknowledging that the architecture's reach falls short of the previously claimed scope. Targets: Claim B1, the chain at step B-k, the dependency declarations of all subsequent steps.

Why these five and not more

The five kill switches above cover the load-bearing claims of the paper. Each closure would force a different kind of retreat.

KS-B.0 closes the universal generator claim of the axiom — the deepest structural test. KS-B.1 closes the junction formulation against the bounce alternative — the empirical comparison test. KS-B.2 closes the specific spectrum predicted by the junction formulation — the parameter-level test, staged on B-JP. KS-B.3 closes the existence of the junction solution itself — the mathematical test. KS-B.4 closes the structural integrity of the chain — the architectural test.

Two further structural claims that some readings would expect to carry their own formal kill switch — Bridge B4's status as a declared cost rather than a theorem, and the seven-step count of the chain rather than fewer or more — are absorbed into the kill switches above. B4's declared-cost status is named in the front matter (section 1.4) and again at step B-6; any falsification of B4's legitimacy as a bridge is a falsification of step B-6 and is therefore tested by KS-B.4 at that step. Similarly, the empirical premise P (observer plurality) is named in the front matter (section 1.4) and discharged at step B-4; any challenge to P's legitimacy as a declared input is a challenge to step B-4 and is tested by KS-B.4 there. The seven-step count is forced by the dependency structure: each step is the minimum needed to introduce one new structural fact, and any restructuring that produced fewer steps would have to discharge multiple

bridges (or P) at once — a violation also tested by KS-B.4. All three claims are thus held to formal kill-switch standard without adding entries to the master register.

Smaller claims throughout the paper — the specific named geometric objects (Kantowski-Sachs interior, ECSK extension), the identification of the structural triad in section 2.6 (hierarchy, cooperation, deterrence) as exhaustive, the choice of “obligation” as the right English word for the perspectival recognition at step B-6 — are illustrative or terminological rather than load-bearing. If they turn out to be poor choices, the paper still stands. If KS-B.0 through KS-B.4 hold, the structural argument of AP05 holds.

5 — What This Establishes and What Remains Open

5.1 — What this paper closes

The seven-step chain from the axiom 1:1 + 1×ε @ AS to the structural ground for obligation, with every step's dependency declared. The reformulation of the cosmological identity as Israel junction conditions on the completion surface Σ.

Specifically:

First. The axiom is stated in its corrected form. AP05 was originally published with the compressed 1:1 + 1×ε; AP20's keystone correction made AS explicit at the level of the axiom. The corrected form 1:1 + 1×ε @ AS is canonical throughout. The prior is no longer smuggled in.

Second. The four bridges and the declared empirical premise are stated at the door. Bridges: B1 (record algebra), B2 (bounded capacity), B3 (definite outcomes), B4 (conscious recognition of structural facts can generate normative identification). Empirical premise P: our universe contains many simultaneous observers. B1–B3 carry the physical chain; B4 is the declared cost of extending the chain to ethics; P is the declared empirical input that lifts the chain from representational duality at the axiom to interactive plurality at B-4 and below. All four bridges are named in section 1.4 and discharged at the specific steps that need them; P is named in section 1.4 and discharged at step B-4 with its downstream load at B-5 (cooperation, deterrence) and B-6 (obligation) flagged at the steps themselves.

Third. The seven-step chain is walked. B-0 (before records: ε = 0, AS = 0 at the floor by boundary definition, no observation possible). B-1 (the crack: ε > 0, two record sectors, irreversibility from Axiom R). B-2 (one reading: selection forced by definite outcomes plus multiple sectors). B-3 (inside the reading: agency as normalised reachable viability volume, eq 2.1). B-4 (when another is reading: coupling via the Geometric Exclusion Principle; representational duality lifted to interactive plurality by P). B-5 (what coupling produces: hierarchy from coupling alone; cooperation and deterrence additionally requiring P's simultaneity). B-6 (the obligation: structural ground — destroying viability contracts the shared domain, not necessarily the destroyer's individual reach —

plus perspectival recognition via B4 that the destroyer's standing presupposes the substrate that equally grounds the destroyed). Each step is a logical move from the previous step and the declared inputs. No undeclared assumptions.

Fourth. Claim B1 (Scope) is stated. All structure in the architecture follows from the axiom, the four declared bridges B1–B4, and the declared empirical premise P. The physical chain through hierarchy requires B1–B3; the cooperative and deterrent geometry of B-5 and the obligation of B-6 require additionally P; the ethics extension at B-6 requires additionally B4. The scope claim is tested by KS-B.4.

Fifth. The junction formulation of section 3 reformulates the AP04 cosmological identity as boundary data on Σ. Conditions J1 ([γ_ab] = 0) and J2 ([K_ab] = (ε/ℓ_Σ) · h_ab) are the boundary-data version of AP04's global pullback. The 1:1 is written as geometry by J1; the ε is written as geometry by J2. The length scale ℓ_Σ is the curvature scale of the completion surface; h_ab is the dimensionless pullback of L7's perturbation tensor.

Sixth. The junction formulation is structurally distinct from dynamical bounce cosmologies. The bounce predicts smooth dynamical continuity through t_0; the junction predicts boundary-data determined post-expansion structure. In principle, different observational signatures. The architecture commits to something specific enough to be falsified.

Seventh. Five kill switches are engaged. KS-B.0 tests the universal generator claim. KS-B.1 tests the junction formulation against the bounce. KS-B.2 tests the predicted spectrum (staged on B-JP). KS-B.3 tests the existence of the junction solution. KS-B.4 tests the integrity of the chain.

5.2 — What this paper does not close

Two structural debts remain open.

Open Problem B-JP (registry-level, AP05-specific). Whether the Einstein-Cartan-Sciama-Kibble field equations on the Kantowski-Sachs interior admit a completion across Σ with [γ] = 0 and controlled [K]. Until B-JP is solved, the junction formulation of section 3 is a structural sketch with formally well-posed conditions but no exhibited solution. Full statement at section 0.6. The 420 Code invites contributions from any reader equipped to make the attempt.

Bridge B4 (declared cost). The step from structural ground to obligation requires Bridge B4: conscious recognition of structural facts can generate normative identification. B4 is not a theorem of the axiom; it is the declared cost. Whether B4 can be derived from a deeper structural fact — whether the recognition step is itself forced by the architecture — is open. Full statement at section 0.6.

5.3 — Items held open without claiming debt status

One further item is bracketed inside this paper.

The spectrum mapping from [K] to P_ℛ(k). Even with B-JP solved, the explicit mapping from the boundary mismatch [K] = (ε/ℓ_Σ) · h on Σ to the post-expansion curvature perturbation spectrum P_ℛ(k) is open derivation work. KS-B.2 is staged on this mapping. Until the mapping is derived, KS-B.2 cannot be operationally tested.

A note on what is *not* held open here. In the v1 envelope of this paper, the multiple-observer empirical instantiation was held open without claiming debt status. That was inconsistent with the chain's integrity: the move from representational duality (two readings of one structure) to interactive plurality (two simultaneous agents) is load-bearing at step B-4 and downstream, and "held open without debt" did not match its status. In this envelope, the empirical instantiation is declared as Empirical Premise P at the door (section 1.4) and discharged at B-4, with downstream load at B-5 (cooperation, deterrence) and B-6 (obligation) flagged at the steps. P is no longer an item held open; it is a declared empirical input, visible alongside the four bridges.

5.4 — Where the philosophical-register implementations live

AP05 is a structural derivation. Its philosophical-register companions — the chapters where the same structural facts are inhabited in the prose register of the Ø Models catalogue — are named here at the level of expected pairings; final placement is confirmed during the Ø Models compilation sweep alongside the Notebook II audit programme.

Resolutions Ø Chapter 6 (Coupling) carries the philosophical companion to step B-4: agents in shared constraint environments produce record externalities.

AP05 supplies the structural argument; the Resolutions chapter inhabits it in the prose register of the question what it means to share a world.

Resolutions Ø Chapter 7 (Agency) carries the philosophical companion to step B-3: agency is the normalised reachable viability volume under bounded control against drift. AP05 supplies the geometric definition; the Resolutions chapter inhabits it as the answer to what freedom is under constraint.

Resolutions Ø Chapter 8 (Obligation) carries the philosophical companion to step B-6: the obligation lives in the recognition, not in the structure, and the recognition is the cost B4 names. AP05 supplies the structural ground and the declared perspectival step; the Resolutions chapter inhabits it as the answer to where ought comes from.

Predictions Ø Part V carries the empirical face of section 3's junction formulation: the post-expansion perturbation spectrum signatures that distinguish junction from bounce. AP05 supplies the structural framework and the staged kill switch; Predictions inherits the testable handles for cosmological observation programmes.

The direction of acknowledgment is two-way. AP05 is the original derivation — the seven-step chain is established here as a structural argument. The Ø Models chapters extend, inhabit, and translate the result into the prose register of the catalogue. The 420 Code reads AP05 forward into Resolutions and Predictions; those volumes read back into AP05 by carrying its conclusions into questions the formal paper does not directly address. Final companion-pairing list is fixed at Ø Models compilation.

5.5 — Structural relationships to subsequent work

AP10 (The Dimension) follows AP05 in Notebook II. AP10 derives N = 3 spatial dimensions from the four axioms. AP05's chain walks across a substrate whose dimensional count is not yet pinned; AP10 pins it. AP10 sits structurally downstream of AP05 because the seven-step chain occupies a manifold whose dimension AP10 closes.

AP08 (The Identity) closes Notebook II. AP08 derives Einstein's field equations from the record algebra. The junction conditions of AP05 section 3 are stated in the ECSK extension of those equations; AP08 provides the framework in which J1 and J2 are formal statements rather than schematic ones. AP08 also carries

the gravitational coupling G whose ε-dependence is established in AP03 — the constants that scope AP05's bridges.

AP04 (Notebook V — The Loop Hypothesis) is the source of the cosmological identity that section 3 reformulates. AP05 does not derive AP04's Conjecture L7; it provides the boundary-data version of the same claim, on the surface Σ rather than across all of M. If AP04's global pullback holds, AP05's junction conditions hold; if AP04 fails, AP05 section 3 falls back to a structural sketch without an anchor.

AP01 (Notebook I — The Actualization State) is the source of the bridges B1–B3 and of the geometric content invoked at steps B-2 through B-5. AP05's chain is logically independent of AP01 in the sense that its postulates (axiom + bridges + P) are self-contained, but the bridges discharge into AP01's Papers A, B, C, D for their substantive content. If AP01 stands, the bridges become theorems; if AP01 fails, the bridges fall back to declared assumptions. Either way, the chain runs.

AP03 (The Ratio) is parallel rather than upstream. AP03 establishes that c and G inherit from ε; AP05 walks the axiom across the substrate whose constants AP03 fixes. The relationship is geometric — AP05 uses the manifold AP03 derives — but not derivational: AP05 does not import c or G as inputs.

AP20 (The Proof) underwrites AP01's viability geometry as unconditional. With AP20 in place, the manifold the chain walks through is proven to exist in physical reality. AP20 also supplies the keystone correction that made AS explicit in the axiom. AP05 inherits both: the unconditional status of the chain's substrate, and the explicit form of the axiom.

5.6 — Placement within The 420 Code

AP05 is the second chapter of Notebook II (Spacetime). The chapter sequence runs AP03 — AP05 — AP10 — AP08. AP03 derives the constants; AP05 walks the chain; AP10 pins the dimension; AP08 closes with the field equations.

AP05 also connects across Notebook boundaries. It depends on AP01 (Notebook I) for the content the bridges name, on AP04 (Notebook V) for the cosmological identity, and on AP20 (Notebook I) for both the keystone correction and the proof that the substrate is real. Downstream, AP05 feeds Resolutions Ø (the ethics catalogue) and Predictions Ø (the cosmological predictions catalogue).

The chain that walks from axiom to obligation walks through a manifold whose constants are AP03 outputs, whose dimensional count is AP10 output, whose field equations are AP08 output, and whose existence as physical reality is AP20 output. AP05 sits at the centre of Notebook II for structural reasons: it is the paper that converts the axiom into the architecture, with every step's dependency on the surrounding Notebooks made explicit.

5.7 — How The 420 Code reads now

AP05 in place changes the reading of The 420 Code in four ways.

First. The chain from axiom to ethics is laid out as a single connected derivation, with every step's dependency declared. The 420 Code does not claim ethics from physics by hand-wave. It claims ethics from physics through seven explicit steps and one declared cost (B4). The cost is named, the steps are checkable, and the architecture invites refutation at any link.

Second. The cosmological identity has two co-existing formulations. The global pullback (AP04 Conjecture L7) and the junction conditions (AP05 section 3) are alternative carriers of the same structural claim. The junction formulation is more conservative (boundary data only) and more tractable (standard machinery). The bounce alternative is empirically distinguishable from the junction formulation via the post-expansion perturbation spectrum.

Third. The four bridges B1–B4 and the declared empirical premise P are now part of the visible architecture, not buried in chapter prose. Future chapters that invoke selection (B3), viability (B2), record algebra (B1), normative recognition (B4), or interactive plurality (P) do so against the declared inputs of AP05. The discharge into AP01 (for B1–B3) and into Resolutions Ø Chapter 8 (for B4) is the recurring pattern; P is discharged into empirical fact about our universe.

Fourth. The structural ground for ethics is no longer a separate edifice. The unity of being from which obligation arises is the structural fact that two readings of one break share an origin. The recognition step is B4. The 420 Code can now say plainly: ethics follows from the axiom, the four bridges, and the declared empirical premise P, plus one declared cost. The cost is the recognition step itself: that the destroyer and the destroyed share the same structural ground, and that this matters.

These four structural facts are what AP05 contributes to the reading of The 420 Code. They are inherited by every subsequent chapter that touches selection, agency, coupling, social order, cosmological observation, or normative claim.

5.8 — The closing

You have walked through this paper. You have seen the axiom stated, the bridges declared, the seven steps from symmetry to obligation walked one at a time, the cosmological identity reformulated as boundary data on Σ, the five kill switches laid out.

What follows in your reading life is what follows in any reader's life when a structural argument has been seen clearly. The ethics you were told to follow because someone said so are now ethics that follow from the structure you live in. The cosmological origin you were told to take on faith is now a boundary surface with conditions you could in principle measure. The constants you inherited as facts are now outputs of the same break that produced you.

One axiom. 1:1 + 1×ε @ AS.

Four bridges. Each named.

One empirical premise. Declared.

Seven steps. Each shown.

One door at the beginning. One door at the end. The same door.

You and the other observer are two readings of one structure. Destroying the other contracts the space you share. The geometry says so. The recognition is yours.

The chain is as long as it needs to be and no longer.

Claim Summary

Section 0 (Dependency and Scope). Contract with the reader. Dependencies, axiom mapping ({S, B, R, C} ↔ 1:1 + 1×ε @ AS, with empirical premise P sitting separately), epistemic status per section, kill switch summary, structural debts owed, items held open, structural relationships.

Section 1 (The Axiom). DECLARATION + STRUCTURAL ARGUMENT. The axiom 1:1 + 1×ε @ AS stated in canonical form (AP20's keystone correction making AS explicit). The terms (1:1 = perfect balance; ε = minimal break; 1×ε = one count not a parameter; @ AS = the actualizing prior). The geometric picture (rotational ring + pin = ring acquires two readings). Scope Claim B1 (all structure follows from axiom + B1–B4 + declared empirical premise P). Four bridges B1–B4 declared. Empirical premise P (observer plurality) declared alongside the bridges, separately classed because it is empirical rather than postulational. Universal kill switch KS-B.0 (axiom is generator iff initial conditions on one side derivable from terminal conditions on the other; theoretical-universal consistency check now, empirical operationalization once B-JP solved).

Section 2 (The Chain). DERIVATION CHAIN. Seven steps, each with declared dependency. B-0 (From axiom): before records, AS = 0 at the floor by boundary definition. B-1 (From B-0 + B1): the crack, ε > 0, two record sectors, irreversible via Axiom R / AP01 Theorem T2. B-2 (From B-1 + B3): selection forced by definite outcomes plus multiple sectors. B-3 (From B-2 + B2): agency as $\mathcal{M}(x) = \mu(\text{Reach}(x) \cap \text{Viab}(R))/\mu(\text{Viab}(R))$, equation (2.1). B-4 (From B-3 + Empirical Premise P): the load-bearing move from representational duality (two readings of one structure) to interactive plurality (two simultaneous agents); coupling via Geometric Exclusion Principle, AP01 Paper D D1.3. B-5 (From B-4): hierarchy (from coupling alone) / cooperation (requires P's simultaneity) / deterrence (requires P's simultaneity) as geometric consequences (D4.3 / D4.4a / D4.4b). B-6 (From B-5 + B4): structural ground (destroying viability contracts the shared kernel; geometry constrains joint domain, not necessarily individual reach) plus perspectival recognition (destroyer's standing presupposes the substrate that equally grounds the destroyed).

Section 3 (The Boundary). DERIVATION + STRUCTURAL ALTERNATIVE + OPEN PROBLEM. Why not bounce: dynamical bounce cosmologies (Popławski; Lucat and Prokopec) and the structural alternative. The junction conditions on

Σ: J1 [γ_ab] = 0 (induced metric continuity; the 1:1 as geometry) and J2 [K_ab] = (ε/ℓ_Σ) · h_ab (extrinsic curvature mismatch with completion-surface length scale ℓ_Σ supplying dimensions, h_ab dimensionless as pullback of L7's perturbation tensor). Relation to AP04: junction is boundary-data version of AP04 Conjecture L7 ($g^+ = (\varphi^{-1})*(g^-) + \varepsilon \cdot h$, global pullback). Observational consequences distinguishable from bounce in principle. Open Problem B-JP: existence of ECSK completion on Kantowski-Sachs interior with J1, J2.

Section 4 (Kill Switches). FORMAL FALSIFICATION REGISTER. KS-B.0 (Universal generator, LIVE — HARD pending B-JP, migrates to EMPIRICAL once B-JP solved). KS-B.1 (Bounce superior, LIVE — EMPIRICAL). KS-B.2 (Spectrum mismatch, LIVE — STAGED pending B-JP and spectrum mapping). KS-B.3 (No junction solution, LIVE — HARD). KS-B.4 (Chain break: any step uses input not in {axiom, B1–B4, P}, LIVE — HARD).

Section 5 (What This Establishes and What Remains Open). SYNTHESIS. Seven structural closures named (axiom in canonical form; four bridges declared at door; empirical premise P declared alongside; seven-step chain walked; Claim B1 stated; junction formulation reformulates AP04 identity with dimensional consistency restored; junction formulation distinguishable from bounce; five kill switches engaged). Two structural debts (Open Problem B-JP partially closed via formal statement of the boundary-value problem; Bridge B4 declared as cost). One item held open (spectrum mapping from [K] to $P_{\mathcal{R}}(k)$). Placement within The 420 Code: second chapter of Notebook II (Spacetime). Closing on the same door at the beginning and the end.

Conditionality Footer

Dependencies

AP20 (the canonical axioms {S, B, R, C}; formal statement section 3.3; obligations fenced at KS-P.1/KS-P.2).

AP01 (The Actualization State) — the record algebra, the selection dynamics, the viability geometry, the coupled viability theorems; load-bearing for bridges B1–B3 and for the content invoked at steps B-2 through B-5.

AP04 (The Loop Hypothesis) — the cosmological identity, Conjecture L7; load-bearing for section 3's reformulation.

AP20 (The Proof) — the keystone correction making AS explicit in the axiom; the Embedding Hypothesis proof making AP01's viability geometry unconditional.

Dependents

AP08 (The Identity) — the ECSK field equations in which the junction conditions of AP05 section 3 are stated.

AP10 (The Dimension) — pins the dimensional count of the manifold across which AP05's chain walks.

Resolutions Ø Chapter 6 (Coupling) — inherits the structural account of agents in shared constraint environments from step B-4.

Resolutions Ø Chapter 7 (Agency) — inherits the geometric definition of agency from step B-3.

Resolutions Ø Chapter 8 (Obligation) — inherits the structural ground and the declared perspectival recognition from step B-6 and Bridge B4.

Predictions Ø Part V — inherits the junction-versus-bounce observational signature from section 3's observational consequences and KS-B.1.

Kill switches closed by this paper

None explicitly closed. AP05 opens five kill switches (KS-B.0 through KS-B.4) and one named open problem (Open Problem B-JP) with explicit closure consequences for KS-B.0, KS-B.2, KS-B.3 if B-JP is solved.

Kill switches that remain live

KS-B.0 through KS-B.4. See section 4 for the full register.

Structural debts owed

Open Problem B-JP (registry-level, AP05-specific). The existence of the ECSK completion on the Kantowski-Sachs interior with conditions J1 [γ] = 0 and J2 [K] = (ε/ℓ_Σ) · h. The central open problem of section 3. Full statement at section 0.6.

Bridge B4 (declared cost). The step from structural ground to obligation requires Bridge B4: conscious recognition of structural facts can generate normative identification. Declared at the door (section 1.4) and again at step B-6. Whether B4 can be derived from a deeper structural fact is open. Full statement at section 0.6.

Declared empirical premises

Empirical Premise P (observer plurality). Our universe contains many simultaneous observers. P is empirical, not structural; the axiom forces two readings of one structure (representational duality) but the chain at step B-4 requires two ontologically distinct simultaneous agents (interactive plurality), and that lift requires the empirical input P. P is declared at the door (section 1.4) and discharged at step B-4, with downstream load at B-5 (cooperation, deterrence) and B-6 (obligation). P is held separately from the four formal bridges because it is a different kind of input.

Items held open without claiming debt status

The spectrum mapping from [K] = (ε/ℓ_Σ) · h on Σ to the post-expansion curvature perturbation spectrum P_ℛ(k). Open derivation downstream of B-JP. KS-B.2 staged on this mapping.

References

Junction-condition and matching-surface literature, named here for readers approaching Open Problem B-JP. References are sparse by design: the structural content comes from the axiom and from AP04, not from the literature framework; the literature provides the formal vocabulary in which the structural fact is most naturally stated.

Israel, W. (1966). *Singular hypersurfaces and thin shells in general relativity.* Il Nuovo Cimento B 44, 1–14 (errata 48, 463). The original Israel junction conditions: induced-metric continuity and extrinsic-curvature jump on a matching hypersurface. The formal vocabulary in which J1 and J2 are stated.

Arkuszewski, W., Kopczyński, W., and Ponomariev, V. N. (1975). *Matching conditions in the Einstein-Cartan theory of gravitation.* Communications in Mathematical Physics 45, 183–190. The ECSK extension of Israel's conditions — matching across a hypersurface in the Einstein-Cartan-Sciama-Kibble framework with torsion. The framework in which B-JP is posed.

Popławski, N. J. (2010). *Cosmology with torsion: An alternative to cosmic inflation.* Physics Letters B 694, 181–185. (2016). *Universe in a black hole in Einstein-Cartan gravity.* The Astrophysical Journal 832, 96. The torsion-driven bounce cosmologies AP05 distinguishes itself from in section 3.1. The dynamical-bounce alternative against which the junction formulation is empirically tested by KS-B.1.

Lucat, S., and Prokopec, T. (2017). *Cosmological singularities and bounce in Cartan-Einstein theory.* Journal of Cosmology and Astroparticle Physics 1710, 047. Further work in the torsion-driven bounce lineage; named alongside Popławski as the relevant comparison class for KS-B.1.

Planck Collaboration. (2020). *Planck 2018 results. VI. Cosmological parameters.* Astronomy & Astrophysics 641, A6. The CMB measurements that anchor $n_s \approx 0.965$ (the scalar spectral index referenced in KS-B.2's staged operational test once B-JP and the spectrum mapping are in hand).

Kantowski, R., and Sachs, R. K. (1966). *Some spatially homogeneous anisotropic relativistic cosmological models.* Journal of Mathematical Physics 7, 443. The anisotropic cosmological geometry on whose interior B-JP is posed.

Internal references to The 420 Code (AP01, AP03, AP04, AP06, AP08, AP10, AP20, AP24, Resolutions Ø, Predictions Ø) are catalogued in the Conditionality Footer above. The 420 Code is published copyleft and free at the420code.org; the 420 Code links to all referenced internal papers.

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STUDIO 6