KURPISHEV LOGIC 2: Final Monograph of the Doctrine

Volume III. NAPG3, FOS, Size@Dimensionality and Transreper Geometry

Ivan Borisovich Kurpishev — Independent Researcher, Kaliningrad — me@kurpishev.ru

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Editorial passport of Volume III

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Volume title. *Volume III. NAPG3, FOS, Size@Dimensionality and Transreper Geometry*.

Author. Ivan Borisovich Kurpishev, Independent Researcher, Kaliningrad, `me@kurpishev.ru`.

Editorial law. This English assembly is not a shortened digest. It preserves the master-corpus rule of the Doctrine: definitions, formal chains, proofs, tables, source boundaries, and phenomenological explanations are not deleted; they are reorganized, translated, normalized, and prepared for publication.

Scope. The volume collects the geometric core of the project: NAPG3, FOS, Size@Dimensionality, hyparxis, apeiron, transreper space, the quadratic obstacle, Reper-measure determination, the Fano carrier, PN.2, holes and stitching, KLT-RBD audit of geometric formula chains, and the Fundamental Theorem of Algebra as a FOS reduction.

Continuity. Volume III continues Volume I, where Kurpishev Logic is fixed as non-associative packet Reper logic, and Volume II, where the anthropology of cognition is fixed as a theory of historical matrices of perception and understanding.

Abstract, novelty and map of Volume III

Abstract

Volume III develops the geometric core of the final monograph of the Doctrine. Its central objects are NAPG3, the Fundamental Supporting Connectivity (FOS), the system of Size@Dimensionalities, hyparxis, apeiron, transreper space, the quadratic obstacle, the Fano carrier, PN.2, and the KLT-RBD audit of geometric formula chains.

The main thesis is precise: geometry in the Doctrine is not an auxiliary language. It is the formal way in which sufficient foundation is made geometric. A classical point, line, plane, or volume is a local space-like reduction. Above the local levels stand non-local Size@Dimensionalities: hyparxis, apeiron/FOS, and the observational-conscious dimension `iH`. Their coordinated assembly forms the domain in which a judgment, formula, action, world, chemical reaction, physical event, document, or software object receives a common Reper contour.

The novelty of this volume consists in the following construction. FOS is not the set of all things; it is the condition of Reper-realizability of any possible world. NAPG3 is the non-associative packet geometry of admissible transitions between local and non-local Size@Dimensionalities. Transreper space is the geometric form of the law of sufficient reason. Classical quadratic measure determination of Space*Time is reduced to Reper-measure determination in Kurpishev Time@Space. The classical Fundamental Theorem of Algebra is interpreted as a special FOS reduction to the complex field of roots.

Core chain:

$$x \mapsto C@C_x \mapsto \mathrm{Rep}_x(R, I, U; D) \mapsto \lambda_x \mapsto \mathrm{Status}_x \mapsto \mathrm{RBD}_x\,.$$

Truth rule:

$$\mathrm{Truth}(x) \iff \mathrm{Dom}(x) \wedge D_x \wedge \mathrm{cr}(U_x, I_x; R_x, D_x) = -1.$$

FOS rule:

$$\mathrm{FOS} \neq \sum_i W_i, \qquad \mathrm{FOS} = \mathrm{Cond}\{W_i \text{ is Reper-realizable}\}.$$

Authorial constructions fixed in Volume III

The following authorial constructions of I. B. Kurpishev are fixed in this volume: NAPG3, Size@Dimensionality, FOS, hyparxis, apeiron, transreper space, Reper-limit, supporting layer `O@S`, skew channel `P@S`, Kurpishev Time@Space, Reper-measure determination, the quadratic obstacle, Kurpishev PN.2, packet reduction of the Fundamental Theorem of Algebra, the packet model of local and non-local worlds, and KLT-RBD audit of geometric formula chains.

$$\mathfrak{G}_K = (\text{NAPG3}, R@R, \text{FOS}, \text{TrRep}, O@S, P@S, \Delta, \Xi, \Upsilon, \text{Hodge}_K).$$

$$R@R_K = \{\text{point}, \text{line}, \text{plane}, \text{cavity}; \text{Hyparxis}, \text{Apeiron} / \text{FOS}, iH\}.$$

$$\text{classical geometry} \neq \text{Kurpishev packet geometry}.$$

Layer	Classical background	Authorial extension
Projective geometry	cross-ratio, harmonic quadruple, improper elements	sufficient foundation as Reper support and transreper space
Affine geometry	parallelism, affine transformations, coordinate models	central-affine regimes of perception and ISO/FSO distinction
Riemannian geometry	metric, tensor, curvature, connection	CGI, P@S, O@S and supporting packet-projective connectivity
Complex plane	complex numbers as plane geometry	FOS reduction of the Fundamental Theorem of Algebra and complex Reper
Fano plane	finite projective plane	ontological barrier and packet-obstruction carrier

1. Initial geometric ontology: event@state and the packet point

1.1 From point to event@state

Classical geometry begins with the point. In the Doctrine this beginning is already a reduction. The point does not contain its own act of appearance, nor does it contain the layer in which the appearance is held. Therefore the minimal object is not a point but **event@state**.

An event without a state has no geometric fixation. A state without an event has no carrier. The pair `C@C` is not a metaphor; it is the minimal geometric unit of the project.

$$c = C@C = (e, s).$$

The classical point is then a reduction of event@state under a chosen foundation:

$$\text{point} = \Theta_{\text{loc}}(C@C; D_{\text{pt}}).$$

A packet line is generated by fixing the state layer:

$$L_s = \{(e, s) : e \in E\}.$$

The event sheaf over states is:

$$\mathcal{S}_E : s \longmapsto \{e : (e,s) \in C@C\}.$$

1.2 Packet point and localization limit

A packet point is not identical with an Euclidean point. An Euclidean point has zero size inside an already given metric space. A packet point is a supported localization limit of an event@state inside a chosen foundation.

$$p_{\text{pkg}} = \lim_{D \to D_p} (C@C, D).$$

$$\text{Loc}_D(c) = 1 \iff c \in \text{Dom}(D) \wedge D \text{ supports } c.$$

$$p_{\text{pkg}} \not\equiv \text{atom}, \qquad p_{\text{pkg}} \equiv \text{supported limit}.$$

$$C@C \xrightarrow{D} \text{Rep}(C@C) = (R, I, U; D).$$

Scheme III-A. Initial geometric chain.

```
unformed act
  -> event@state C@C
  -> packet point under foundation D
  -> Reper with a field of possibilities
  -> truth/status under harmonic normalization
```

2. Reper-limit and Fundamental Supporting Connectivity

2.1 Reper as a geometric quadruple

A Reper holds four positions: real content, invariant/idea/address, universe of possibilities, and sufficient foundation. Without sufficient foundation, the triple `(R,I,U)` remains an incomplete flag. With `D`, it becomes a Reper quadruple.

$$\text{Rep}(c) = (R_c, I_c, U_c; D_c).$$

$$(R, I, U) \nRightarrow \text{Truth}\,.$$

$$(R, I, U; D) \Rightarrow \text{Rep}_{\text{complete}}\,.$$

The projective-harmonic coefficient is:

$$\lambda = \frac{(U-R)(I-D)}{(U-D)(I-R)}, \qquad \delta_{\text{truth}} = |\lambda + 1|.$$

2.2 FOS as the limit of Reper assemblies

FOS is the Fundamental Supporting Connectivity. It is not an inventory of objects. It is the condition under which an object, world, formula, proof, action, physical event, chemical reaction, document, or software system can receive a Reper form.

$$\mathrm{FOS} = \lim_{\tau \in \mathcal{T}} \prod_{c \in \mathrm{Ob}(\mathcal{C}_\tau)} (R_c, I_c, U_c; D_c).$$

A thing is real in a world only under an admissible reduction of FOS:

$$x \in W \text{ is real in } W \iff \exists \Theta_W : \mathrm{FOS} \to \mathrm{Rep}_W(x).$$

$$W = \Theta_W(\mathrm{FOS}; D_W).$$

$$\mathcal{W}_K = \{W_{\mathrm{log}}, W_{\mathrm{geom}}, W_{\mathrm{phys}}, W_{\mathrm{chem}}, W_{\mathrm{anthro}}, W_{\mathrm{legal}}\}.$$

$$\mathrm{FOS} \neq \bigcup_{W \in \mathcal{W}_K} W, \qquad \mathrm{FOS} = \mathrm{Support}(\mathcal{W}_K).$$

FOS reduction	Foundation	Result
logical	sufficient reason and Reper quadruple	true judgment or gap
geometric	supporting connectivity and Size@Dimensionality	point, line, plane, cavity
physical	law, observer, metric, O@S	event@state in Time@Space
chemical	reaction medium, energy, substance	substance@state and Evidence-D
anthropological	matrix of perception, memory, document	knowledge, trace, image, understanding

3. NAPG3: non-associative packet geometry

3.1 Object of NAPG3

NAPG3 is the third-level non-associative packet geometry. It studies admissible packet operations which cannot be reduced to ordinary associative multiplication. Ordinary multiplication assumes that changing parentheses does not change the result. In packet geometry, the order of assembly is ontological: first an event may be given, then a state, then a foundation; or the foundation may intervene first and change the mode of localization.

$$\mathrm{NAPG3} = (\mathrm{Ob}_{\mathrm{Pack}}, @, \star, \mathrm{Hodge}_K, \Delta, \Xi, \Upsilon, \mathrm{FOS}).$$

The associator is the diagnostic of packet non-associativity:

$$\mathrm{Assoc}(X, Y, Z) = (X@Y)@Z - X@(Y@Z).$$

The packet associator is not a defect to be erased. It records the fact that a transition depends on the order in which event, state, dimension, and foundation are assembled.

$$\mathrm{Assoc}_{\mathrm{Pack}}(C, S, D) \neq 0 \quad \Rightarrow \quad \text{the foundation changes the result of assembly.}$$

3.2 Hodge star and the Hodge-Kurpishev super-operator

The Hodge star is used as the geometric model of dualization. In this volume, the star is not used as a loose symbolic multiplication. It is kept distinct from the packet associator.

$$X * Y = (X, \mathrm{Hodge}_X(Y)).$$

For a stratified system the Hodge-Kurpishev super-operator is expressed schematically as:

$$\mathfrak{H}_K = \star_3 \circ \mathcal{L}_3^* \circ \star_2 \circ \mathcal{L}_2^* \circ \star_1 \circ \mathcal{L}_1^* \circ \star_0 \circ \mathcal{L}_0^* \circ \star_{-1}.$$

The operator is not merely analytic. It is a transport device across levels of Size@Dimensionality.

3.3 Categorical scheme Pack

The category `Pack` has packet objects as objects and admissible packet maps as morphisms.

A packet morphism is a triple:

$$f = (f_{\mathrm{loc}}, f_{\mathrm{dual}}, f_D),$$

where `f_loc` preserves the local carrier, `f_dual` is compatible with the Hodge operation, and `f_D` transports sufficient foundation.

Compatibility with Reper form is:

$$f(\mathrm{Rep}(c)) = \mathrm{Rep}(f(c)).$$

Compatibility with truth authorization is:

$$\mathrm{Truth}(c) \Rightarrow \mathrm{Truth}(f(c))$$

only when `f` preserves domain, foundation, and the harmonic quadruple. If any of these components is absent, the morphism sends the object to `gap`, `candidate`, or `source`, not to truth.

4. Seven Size@Dimensionalities in Kurpishev Time@Space

4.1 Four local space-like R@R levels

The local space-like levels are:

$$R@R_{\text{loc}} = \{\text{point}, \text{line}, \text{plane}, \text{cavity}\}.$$

They are not primary absolutes. They are local reductions of event@state under a foundation.

Local R@R	Classical analogue	Packet interpretation
point	zero-dimensional localization	supported event@state limit
line	one-dimensional extension	fixed-state event flow
plane	two-dimensional incidence field	packet incidence carrier
cavity	three-dimensional volume/hollow	domain able to contain transition

The cavity is essential. It is the local structure that makes holes possible, but it also makes stitching possible. Without cavity, one has only surface and trajectory; with cavity, one has a domain that can bear missingness, repair, and internal support.

4.2 Three non-local time-like R@R levels

The non-local levels are:

$$R@R_{\text{nonloc}} = \{\text{Apeiron} \,/\, \text{FOS}, \text{Hyparxis}, iH\}.$$

Apeiron/FOS is the fundamental supporting connectivity. Hyparxis is the transitional complex Size@Dimensionality of degree minus one with respect to every space-like R@R. The observational-conscious dimension `iH` contains the layers of controlled memory, construction, and immediate external contemplation.

The full Size@Dimensionality flag is:

$$\text{Flag}_{R@R} = \text{point} \subset \text{line} \subset \text{plane} \subset \text{cavity} \subset \text{Hyparxis} \subset \text{Apeiron} \,/\, \text{FOS} \subset iH.$$

The order is not merely hierarchical. It states a rule of possible reductions: a local world can be cut out only because the non-local layers provide transition, support, and observation.

4.3 Packet flag R@R and reduction discipline

The packet flag allows no arbitrary mixing of dimensions. Each transition requires a domain and a sufficient foundation:

$$R@R_i \to R@R_j \quad \text{is admissible only if} \quad \text{Dom}_{ij} \wedge D_{ij}.$$

The reduction status is:

$$\text{Status}(R@R_i \to R@R_j) \in \{\text{authorized}, \text{conditional}, \text{gap}, \text{candidate}\}.$$

5. Hyparxis, apeiron and the present as a complex FOS section

5.1 Hyparxis

Hyparxis is the transition layer between local and non-local geometry. It is not simply an additional spatial dimension. It is the operator-level passage by which a local form becomes able to change its dimensional status.

$$\text{Hyparxis} = R@R_{-1}^{\text{trans}}.$$

It is attached to the transition operator:

$$\mathcal{L}_k : R@R_k \to R@R_{k-1}.$$

and to the packet passage:

$$\text{Hyp}(X) = \lim_{\epsilon \to 0} (X_k \xrightarrow{\mathcal{L}_k} X_{k-1}; D_\epsilon).$$

Hyparxis is the layer in which a local figure is not destroyed when it changes level. It is the minimal non-locality required for dimensional transition.

5.2 Apeiron as FOS

Apeiron is not chaos and not an indeterminate totality. In this volume it is fixed as the supporting non-local regime of FOS. Apeiron is the condition that a world can be reduced without becoming a random aggregate of fragments.

$$\text{Apeiron}_K = \text{FOS}_{\text{nonloc}}.$$

The transition from apeiron to a world is:

$$\text{Apeiron}_K \xrightarrow{\Theta_W, D_W} W.$$

If the foundation is absent, the reduction is not a world:

$$\neg D_W \Rightarrow \Theta_W(\text{Apeiron}) = \text{fragment field}, \quad \text{not } W.$$

5.3 The present as a complex section

The present is not the whole FOS. It is a section of FOS by an observational setting:

$$N_\omega = \sigma_\omega(\text{FOS}), \qquad \omega = (\text{where}, \text{when}, iH, D).$$

Thus the present is not an absolute world-plane. It is a controlled section: where, when, by whom, and on what sufficient foundation the section is made.

The Kantian form of intuition is therefore translated into an operator of section selection. Space and time are not passive containers; they are forms of FOS reduction.

6. Transreper space and geometry of sufficient foundation

6.1 Sufficient reason as geometry

The law of sufficient reason is not added from outside as a verbal principle. In the Doctrine it is geometrized by the fourth position `D` of the Reper quadruple.

$$\text{three laws} \Rightarrow (R, I, U), \qquad \text{sufficient reason} \Rightarrow D.$$

The incomplete flag is:

$$F = (R, I, U).$$

The completed Reper is:

$$\text{Rep} = F \cup \{D\} = (R, I, U; D).$$

6.2 Improper elements and local actions

Classical projective geometry uses improper elements to close incidence. Transreper geometry uses supporting foundations to close logical, geometric, and documentary incidence.

A local action has the form:

$$\Delta : p_\emptyset \to C@C.$$

An evolution/change has the form:

$$\Xi : C@C_t \to C@C_{t+\tau}.$$

A turn/reversal has the form:

$$\Upsilon : C@C_{\text{act}} \to C@C_{\text{new state}}.$$

The three operators must not be collapsed into one another:

$$\Delta \neq \Xi \neq \Upsilon.$$

6.3 Theorem of transreper foundation

Theorem III.1 (transreper foundation). Let `c` be an object of a packet-geometric world `W`. If `c` is given only by an incomplete flag `(R_c,I_c,U_c)`, then no truth-status can be assigned. If there exists a sufficient foundation `D_c`, an admissible domain `Dom_W(c)`, and the harmonic condition

$$\mathrm{cr}(U_c, I_c; R_c, D_c) = -1,$$

then `c` receives a Reper status in `W`.

Proof. The incomplete flag lacks the fourth harmonic point. Hence it cannot distinguish a real object from a possible object with the same idea and field of possibilities. Adding `D_c` supplies the foundation. Domain supplies admissibility. The harmonic condition supplies projective closure. Therefore truth-status is authorized exactly under the threefold conjunction `Dom ∧ D ∧ cr=-1`. Otherwise the object remains a gap or a candidate.

7. Quadratic obstacle and Reper-measure determination

7.1 Classical metric as quadratic measure determination

In classical geometry, distance is often fixed by a quadratic form:

$$ds^2 = g_{ij} dx^i dx^j.$$

This is a powerful local instrument. It becomes insufficient when the object is not merely located but must also be justified by a foundation, an admissible domain, and a Reper quadruple.

The quadratic obstacle is the fact that a quadratic metric can measure local separation but cannot by itself authorize the truth-status of a packet object:

$$ds^2 \not\Rightarrow \mathrm{Truth}(C@C).$$

7.2 Reper-measure determination in Kurpishev Time

Reper-measure determination supplements quadratic measurement with the Reper quadruple:

$$\mathrm{Measure}_K(c) = \left(ds_c^2, \mathrm{Rep}_c(R, I, U; D), \lambda_c, \mathrm{CGI}_c\right).$$

The status of measurement is:

$$\mathrm{Status}(\mathrm{Measure}_K(c)) = \begin{cases} \text{authorized}, & \mathrm{Dom}(c) \wedge D_c \wedge \delta_{\text{truth}}(c) = 0, \\ \text{critical}, & \mathrm{CGI}(c) \approx 1, \\ \text{gap}, & \neg\,\mathrm{Dom}(c) \vee \neg D_c. \end{cases}$$

Thus measure is no longer only a number. It is a supported Reper-event.

7.3 PIX@PEAKS model of interval

The interval in Time@Space can be represented by a financial analogy: price and value are not identical. Similarly, a metric interval and a Reper interval are not identical.

$$\text{Interval}_K = \text{PIX} \mathbin{@} \text{PEAKS} = (\text{metric size}, \text{support peak}).$$

The packet interval is:

$$I_K(c_1, c_2) = (d(c_1, c_2), D_{12}, \lambda_{12}, \text{CGI}_{12}) \,.$$

This makes explicit which foundation supports the comparison of two packet events.

8. Projective harmony, Desargues-Kurpishev and the Fano carrier

8.1 Harmonic quadruple as geometry of foundation

The harmonic quadruple is the projective form of sufficient foundation:

$$\text{cr}(A, C; B, D) = -1.$$

Given the triple `(A,B,C)`, the fourth point `D` is not arbitrary. It is the harmonic completion required to transform a flag into a Reper.

In the Doctrine this is interpreted as:

$$(A, B, C) \rightsquigarrow (R, I, U), \qquad D \rightsquigarrow \text{sufficient foundation.}$$

8.2 Desargues-Kurpishev theorem

Theorem III.2 (Desargues-Kurpishev, packet form). In an admissible projective-Reper configuration consisting of two non-degenerate conics, a supporting line, and a triple of Reper-flag points, there exists a unique fourth harmonic point `D` which closes the incomplete flag into a Reper quadruple. In the logical reduction this means that every properly authorized inference has a projective-harmonic support structure.

Proof idea: classical harmonic conjugation gives uniqueness of `D` on the projective line; Desargues compatibility transports the construction to the conic and packet layer; the audit discipline requires domain and sufficient foundation, so `D` is not only a point of construction but the foundation of authorization.

8.3 Fano plane as ontological barrier

The Fano plane is a classical finite projective plane. In the present volume it is used not as a novelty claim but as a carrier of obstruction. The transition from local packet obstruction to a global Fano carrier is not automatic.

Let

$$C^0 \xrightarrow{d_0} C^1 \xrightarrow{d_1} C^2$$

be a finite formula-chain obstruction complex, and let

$$q_{OB} : C^1 \to C^2$$

be the quadratic obstruction map. Define:

$$H_{OB} = C^2 / \operatorname{im}(d_1), \qquad O_{OB} = \operatorname{span}(\operatorname{im}(\pi \circ q_{OB})) \subseteq H_{OB}.$$

If `dim_{F_2} O_OB = 3`, then its projectivization is:

$$\mathbb{P}(O_{OB}) \cong \mathbb{P}^2(\mathbb{F}_2).$$

But the global Fano carrier exists only with explicit compatible identification maps. This is the ontological barrier.

9. Fundamental Theorem of Algebra as FOS reduction

9.1 Classical layer

The classical Fundamental Theorem of Algebra states that every non-constant polynomial over the complex numbers has a complex root:

$$P(z) \in \mathbb{C}[z], \quad \deg P \geq 1 \quad \Rightarrow \quad \exists z_0 \in \mathbb{C} : P(z_0) = 0.$$

In Volume III this statement is not denied. It is reinterpreted as a local reduction of a more general FOS theorem about Reper-realizability of a root.

9.2 Packet reduction

A polynomial is treated as a formula-chain object:

$$P \mapsto C@C_P \mapsto \mathrm{Rep}_P(R, I, U; D).$$

A root is not only a solution of an equation but a Reper-realized point of vanishing:

$$z_0 \text{ is a root} \iff P(z_0) = 0 \wedge \mathrm{Dom}_{\mathbb{C}}(P) \wedge D_P.$$

The FOS reduction theorem states:

Theorem III.3 (FTA as FOS reduction). Let `P` be a non-constant complex polynomial with an admissible complex domain and sufficient foundation `D_P`. Then the classical existence of a complex root is a local world-reduction of FOS:

$$\exists z_0 \in \mathbb{C} : P(z_0) = 0 \quad \Longleftrightarrow \quad \exists c_{z_0} \in \Theta_{\mathbb{C}}(\mathrm{FOS}; D_P).$$

The proof reduces the root existence statement to the classical theorem inside the complex world, then records that the complex world itself is an admissible FOS reduction.

9.3 Worlds of DNA, chemistry, biosystems and culture

The same pattern applies to special worlds:

$$W_{\text{DNA}} = \Theta_{\text{DNA}}(\text{FOS}; D_{\text{code}}),$$

$$W_{\text{chem}} = \Theta_{\text{chem}}(\text{FOS}; D_{\text{reaction}}),$$

$$W_{\text{bio}} = \Theta_{\text{bio}}(\text{FOS}; D_{\text{organism}}),$$

$$W_{\text{culture}} = \Theta_{\text{culture}}(\text{FOS}; D_{\text{symbol}}).$$

The important restriction is constant: every reduction must have a domain and a sufficient foundation. Otherwise it is not a world but a gap-field.

10. PN.2, holes and stitching of geometric gaps

10.1 Extended Kurpishev uncertainty principle PN.2

PN.2 states that a packet object cannot be fully fixed simultaneously by size and dimensionality independently of the representative and foundation.

Let

$$\widehat{S}(X, \omega) = \|\omega\|, \qquad \widehat{D}(X, \omega) = \dim X.$$

Then there is no universal natural transformation that fixes both quantities exactly for every packet object without loss of Reper foundation:

$$\nexists \eta : \widehat{S} \Rightarrow \widehat{D} \quad \text{which is exact and foundation-free.}$$

The operational form is:

$$\Delta S \cdot \Delta D \geq \kappa_K(D),$$

where the lower bound depends on the supporting foundation.

10.2 Holes and stitching

A hole is not merely an absence. It is a local failure of support, domain, or transition.

$$\text{Hole}(c) = \neg D_c \vee \neg \, \text{Dom}(c) \vee \text{CGI}(c) > 1.$$

Stitching is not rhetorical repair. It is a controlled operation that supplies a missing admissible component:

$$\text{Stitch}(c) = \text{Patch}(D_c, \text{Dom}(c), \text{Rep}(c)).$$

A stitched object receives a status only after re-audit:

$$\text{Stitch}(c) \Rightarrow \text{Audit}(c) \Rightarrow \text{Status}(c).$$

11. KLT-RBD audit of geometric formula chains

11.1 Why geometry needs audit

A formula-chain step has the form:

$$s = (F_i, F_j, \tau, A, \mathrm{Dom}, D),$$

where `F_i` and `F_j` are formula nodes, `tau` is the transition type, `A` is the support set, `Dom` is the admissible domain, and `D` is sufficient foundation.

Audit rule:

$$\mathrm{cr}(U, I; R, D) = -1 \not\Rightarrow \text{truth status}$$

unless `Dom` and `D` are explicitly present.

Thus the KLT-RBD audit creates gap nodes when the domain or foundation is absent:

$$\neg\,\text{Dom} \Rightarrow \text{GAP-DOMAIN-MISSING},$$

$$\neg D \Rightarrow \text{GAP-ASSUMP-MISSING}\,.$$

11.2 Statuses of Volume III

Status	Meaning in Volume III
classical known fact	accepted mathematical background
author definition	authorial construction of I. B. Kurpishev
internal theorem	theorem inside KLT/FOS/RBD/NAPG3
conditional theorem	theorem valid under stated domain/foundation
open candidate	construction not yet proved as theorem
gap	missing domain, foundation, or proof transition
legal fixation	item prepared for registration/publication contour

12. Final theorems of Volume III

12.1 FOS theorem

Theorem III.4 (FOS theorem). A world `W` is Reper-realized if and only if it is an admissible reduction of FOS with sufficient foundation `D_W`, and every realized object `c` in `W` has a Reper quadruple, an admissible domain, and harmonic closure.

$$W = \Theta_W(\text{FOS}; D_W) \iff \forall c \in W : \text{Dom}_W(c) \wedge D_c \wedge \mathrm{cr}(U_c, I_c; R_c, D_c) = -1.$$

12.2 NAPG3 theorem

Theorem III.5 (NAPG3 theorem). NAPG3 is the minimal packet-geometric system that simultaneously keeps local Size@Dimensionalities, non-local transition layers, the Hodge-Kurpishev dualization, and the Reper foundation condition.

12.3 Reper-measure theorem

Theorem III.6 (Reper-measure determination). A measurement of a packet object is complete only when the local quadratic measurement is supplemented by Reper foundation, lambda status, and CGI diagnostics.

$$\mathrm{Measure}_{\text{complete}}(c) = \left(ds_c^2, \mathrm{Rep}_c, \lambda_c, \mathrm{CGI}_c, \mathrm{Status}_c\right).$$

12.4 Algebra reduction theorem

Theorem III.7 (FOS reduction of algebra). The classical Fundamental Theorem of Algebra is a local reduction of the FOS theorem to the complex world. Its classical validity is preserved; its foundation is made explicit.

13. Glossary, proof protocol and conclusion

13.1 Authorial packet formalisms of Volume III

Term	Formal role
`C@C`	event@state, minimal object
`Rep(R,I,U;D)`	Reper quadruple
`FOS`	condition of Reper-realizability of worlds
`NAPG3`	non-associative packet geometry
`R@R`	Size@Dimensionality
hyparxis	transition layer of dimensional passage
apeiron	non-local supporting connectivity, FOS regime
`TrRep`	transreper space
PN.2	uncertainty of size and dimensionality
`Hole`	missing support/domain/controlled transition
`Stitch`	controlled repair with re-audit
`KLT-RBD audit`	formula-chain proof and status control

13.2 Proof protocol

Every theorem, formula, and reduction in this volume is assigned to one of the following proof classes:

1. **Classical background.** The item belongs to established geometry, algebra, topology, tensor calculus, or complex analysis.
2. **Author definition.** The item is introduced as a construction of I. B. Kurpishev.
3. **Internal theorem.** The item is proved inside the Reper/FOS/NAPG3/KLT-RBD framework.
4. **Conditional theorem.** The item is valid under stated domain and sufficient foundation.

5. **Open candidate.** The item is not yet closed as a theorem and is preserved as a candidate.
6. **Gap.** Domain, foundation, or proof transition is absent.
7. **Publication/legal fixation.** The item is prepared as part of the publication, site, RBD or registration contour.

13.3 Conclusion

Volume III fixes the geometric core of the Doctrine. The result is not a replacement of classical geometry but a controlled extension: classical affine, projective, Riemannian, complex, and finite-projective structures remain in their proper domains, while NAPG3 and FOS provide the packet-Reper layer that determines when a geometric formula, object, world, or proof transition has sufficient foundation.

The next natural control point is Volume IV, where this geometric core is reduced into the physics branch: Time@Space, causality, determinism, O@S, P@S, the Kurpishev Course of Time, entropy as unmanifest present, PN.1/PN.2, quantum scale@aspect, and CGI holes.

Bibliography and source frame

The source frame of this English assembly consists of:

- I. B. Kurpishev, *Monograph 5.0: Kurpishev Logic. Non-associative packet Reper logic, NAPG 3.0, V@P physics, anthropology of turn, and KLT/RBD applications*, Kaliningrad, 2026.
- I. B. Kurpishev, *Reper-projective architecture of formula chains: PILOT-01*, final bilingual preprint review, 2026.
- I. B. Kurpishev, *KLT_DOCTRINE_VOL3_NAPG_FOS_RU_v7_5*, Russian source of Volume III.
- I. B. Kurpishev, *Stratified Time Theory: Associator Rigidity and Non-associative Packet Geometry*, NAPG monograph source.
- N. Bourbaki, *The Architecture of Mathematics*, Russian translation, Mathematical Education, issue 5, 1960.
- Ya. P. Ponarin, *Affine and Projective Geometry*, Moscow, 2009.
- P. K. Rashevsky, *Riemannian Geometry and Tensor Analysis*, Moscow, 1967.
- V. I. Arnold, *Geometry of Complex Numbers, Quaternions and Spins*, Moscow, 2002.
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Assembly QA appendix

QA-v7.6 status. The following checks are attached to the package as separate control files:

- source binding and continuity map;
- document build report;
- DOCX render report;
- PDF render report;
- SHA256 checksums;
- ZIP integrity test;
- next-point plan for Volume IV.

Next control point. `KLT-DOCTRINE-FINAL-MONOGRAPH-VOLUME-IV-PHYSICS-RU-v7.7`.