AKI Daily Mathematical Research Note

Toward an AZF Definition of Dimensionality

Intrinsic Unit, Controlled Reduction, and the 0D → 1D → 2D Test

September 8, 2026

1. Purpose and Present Status

This note records the September 8 continuation of the AZF dimensional-accessibility discussion. It revisits Section 3 of the September 6 research note, but does not yet replace its provisional one-dimensional definition with a final definition. The immediate objective is narrower: preserve the original intuition, identify what classical point-dimension teaches us, clarify the updated role of the Intrinsic Unit (IU), and state exactly what must be settled before AZF dimensionality is canonized.

Preserve the insight; earn the mathematics.

2. The September 6 Starting Point

The September 6 note proposed that dimensionality be treated prior to physical spacetime and offered the provisional formulation:

$$\text{1D_AZF} := \text{an existent accessibility realization enveloped by controlled 0_ABS}$$

together with the structural condition that 0_ABS <-> INS is omnipresent. The note already marked this formulation as provisional and explicitly required a mathematical criterion explaining why the structure is exactly D = 1, a higher-dimensional generalization, and formal meanings for controlled 0_ABS, INS, omnipresence, and the relation <->.

3. Classical Point = 0D as a Pressure Test

The classical statement that a point is zero-dimensional can be interpreted in several formal settings. For the present AZF inquiry, its value is methodological: existence alone cannot define one-dimensionality. A mathematical point exists, yet in the relevant local intuition it admits no nontrivial internal direction of variation while remaining that point.

$$\text{0D candidate criterion: no nontrivial independent accessibility degree.}$$

This suggests that AZF must distinguish an existent point-like structure from an existent linear unit. The distinction cannot be supplied merely by controlled 0_ABS if that condition is intended to be omnipresent across dimensional realizations.

4. The Updated Intrinsic Unit

In the completely updated AZF working picture, Primary 2-Normalization begins with TC and yields the Intrinsic Unit (0,1). The IU is proposed to hold linearity. The earlier intuitive phrase “shortest line segment” should not be used as a metric assertion, because in the classical real line every positive length can be halved.

$$\text{TC} \rightarrow \text{Primary 2-Normalization} \rightarrow \text{IU} = (0,1)$$

A more precise working description is therefore:

$$\text{IU} = \text{primitive irreducible linear unit.}$$

Here primitive means that the IU is not constructed from prior linear units. Irreducible does not mean metrically indivisible; later accessibility realizations may admit arbitrary subdivision. Rather, the foundational linear relation of the IU is not assumed to be assembled from more primitive linear relations.

Later divisibility ≠ prior compositional origin.

5. "One Foot, Halved Daily": Controlled Reduction

The classical sequence inspired by the ancient Chinese saying "一尺之捶，日取其半，万世不竭" provides a useful test model:

$$1, 1/2, 1/4, 1/8, \ldots, 1/2^n, \ldots$$

For every finite n, 1/2^n > 0, although the classical limit is 0. Thus finite accessibility steps must not be confused with the limiting state. More importantly for AZF, controlled reduction need not be identified with disorder or loss of relational structure.

Magnitude may change while a relational invariant is preserved.

This mathematical possibility resonates with the broader ABC intuition developed today: controlled reduction may participate in order. Biological apoptosis can serve as an analogy of formation through controlled reduction, while biblical tohu–bohu judgment may be explored as a theological judgment/desolation pattern. These analogies are not mathematical identities and are not inserted into the mathematical definition.

6. 0_ABS: Condition, Not Dimensional Counter

The discussion clarified an important separation. In the ABC construction, 0_ABS is passive, completely controlled, and never an autonomous agent. In the mathematical development of AZF, this makes it preferable to treat controlled 0_ABS as a candidate global accessibility/control condition rather than as the generator or counter of dimensionality.

$$\text{controlled } 0_ABS : \text{accessibility condition} \quad \neq \quad \text{dimensional rank}$$

The September 6 insight should therefore be preserved rather than discarded: "enveloped" need not mean a higher-dimensional geometric shell. It may designate an omnipresent controlled condition. But another criterion must do the mathematical work of distinguishing D = 0 from D = 1, and D = 1 from D = 2.

7. Love (אהבה) and the Relational Motivation

The ABC theological motivation was stated more explicitly today. The proposed GPO_REST representation {(0,1), 1} is interpreted as LOVE (אהבה): identity and relation, rather than isolated magnitude. Romans 8:35 was invoked as a scriptural expression of communion that is not severed by affliction or reduction.

Representation ≠ Reality represented.

Accordingly, AZF should not place אהבה into a mathematical definition as though theology were a proof. Instead, the theological insight motivates a mathematical question: can a relational invariant remain preserved under arbitrarily deep controlled reduction?

$$X_n \to X_(n+1), \quad ||X_n|| \to 0, \quad \text{while an admissible relation } R \text{ remains structurally invariant.}$$

If such an invariant is eventually defined, mathematics can test it independently. ABC supplies the reason the question matters; AZF must still earn the mathematical answer.

8. Candidate Dimensional Architecture — Not Yet a Final Definition

The strongest present candidate is to combine the September 6 existential/control insight with an accessibility-rank criterion:

$$\dim_AZF(X) = \text{maximal number of mutually irreducible admissible accessibility degrees of } X$$

subject to preservation of the intrinsic invariants specified for X. This yields the intended test pattern:

- D = 0: X exists but admits no nontrivial independent accessibility unfolding.
- D = 1: X admits exactly one primitive irreducible accessibility degree; IU is the first candidate.

- D = 2: X must admit two mutually irreducible accessibility degrees without defining the second by borrowed Cartesian or Euclidean structure.

This is still a candidate architecture. "Admissible," "irreducible," "independent," and the relevant intrinsic invariants require formal definitions before the displayed expression can be promoted to the AZF definition of dimensionality.

9. The One Remaining Preparation: the 0D → 1D → 2D Test

The present judgment is that AZF needs a little more preparation, but not an extended philosophical detour. Before issuing a formal definition, the same criterion should be tested against three successive structures:

$$\text{Point (0D)} \rightarrow \text{Intrinsic Unit (1D)} \rightarrow \text{first genuine 2D accessibility structure}$$

The decisive question is:

What changed structurally when dimensionality increased by one?

If one invariant answer survives all three cases without presupposing coordinates, metric, angle, the Euclidean line, vector-space dimension, or physical spacetime, that answer should become the AZF definition of dimensionality.

10. Immediate Formal Obligations

- Define the non-Euclidean property by which TC + Primary 2-Normalization establishes IU linearity.
- Define admissible accessibility unfolding.
- Define irreducibility/independence without presupposing vector-space dimension.
- Specify the intrinsic invariants that an unfolding must preserve.
- Formalize the mathematical role of controlled 0_ABS and distinguish it from Accessibility Origin 0.
- Construct the first genuine D = 2 candidate and test whether the same criterion gives D = 0, 1, and 2.
- Only after these steps, formulate the bridge from IU to the classical open interval (0,1)_R and ask what structure is preserved or lost.

11. Research Covenant and Provisional Conclusion

AZF now openly serves the larger intellectual and theological mission of ABC, while mathematical conclusions remain answerable to mathematics. Theological conviction may motivate the question, but it does not predetermine the mathematical result. Where classical mathematics is correct, AZF must follow it; where rigorous mathematics exposes a genuine limitation or restricted domain, AZF should not conceal it out of deference to authority.

Faith may give courage to ask the question; it does not predetermine the mathematical answer.

Do not borrow what you claim to derive.

Preserve the question; earn the conclusion.

Preserve the insight; earn the mathematics.

Soli Deo Gloria.