

I. Breaking Free from Linear Mathematics: A Trend Is Not an "Exponent"

We once borrowed expressions like "infinity raised to the infinite power" in an attempt to describe unlimited expansion of trends. However, this notion is deeply rooted in the inertia of linear mathematics.

In linear mathematics, growth is expressed through exponents, and reduction through roots. But in infinite-dimensional structural mathematics, the accurate expression of a trend is:

- **Infinite large:** Represents a trend spreading outward infinitely (energy trend)
- **Infinite small:** Represents a trend contracting inward from infinite directions (structural trend)

Therefore, "exponent" or "root" are abstract, symbolic expressions, not actual representations of trend structures.

True mathematical language should be based on **direction, dimension, composition, and contraction**.

II. Prototype Definitions of Trend Mechanisms

We view *trend* as the fundamental movement logic within any structure. Its two archetypal forms are:

- **Energy trend (infinite large):** A single point emitting trend information toward infinite directions — the logic of energetic expansion
- **Structural trend (infinite small):** A point receiving trend information from infinite directions — the logic of structural convergence

These two are not opposites, but cyclical co-existences. They form the bidirectional basis of any trend factor.

III. Imperfection: No Complete Infinite Large, No Complete Infinite Small

In the real world:

- A trend released infinitely can never truly reach every direction
- A trend contracting inward can never perfectly align with all incoming inputs

This implies:

- Every energy trend is a "**deficient release**"
- Every structural trend is a "**biased convergence**"

The **incompleteness of trends** is the true driver of structural evolution.

IV. Structural Stability: The Counterbalancing of Trends

A stable structure results from trend factors **simultaneously releasing and absorbing** in multiple directions:

- Trend factors expand outward (energy)
- Trend factors contract inward (structural cohesion)

This counterbalancing process defines the boundaries and form of a structure.

A truly stable structure is not still — it is a **dynamic trend configuration** that maintains balance in motion.

V. The Ontological Language of Trend Structures

We no longer use expressions like "x to the power of n" or "n-th root of x."

The language of infinite-dimensional mathematics is:

- Emitting trends from point A into infinite-dimensional space → **Energy excitation model**
- Absorbing trends into point A from infinite directions → **Structural stability model**
- Incomplete trend release → **Insufficient kinetic energy, no propagation**
- Incomplete trend contraction → **Unstable structure, prone to collapse**

Trend structure is not about *quantities* — it is about **direction–composition–response** relationships.

VI. Conclusion: Trend Is the Root, Structure Is the Response

In infinite-dimensional mathematics, we no longer approximate reality using abstract formulas.

Instead, we start from the essence of trends:

- Let *direction* become the new unit of mathematics
- Let *composition* become the new method of calculation

Infinite large and infinite small are not numeric extremes — they are *trend states*.

Trend is not an adjective — **it is the subject of mathematics**.

This is the true foundation of infinite-dimensional mathematics.

— Author's Note:

This article serves as the **first principle definition** for the theory of infinite-dimensional mathematics.

Subsequent model derivations, trend-language development, and structural simulations will all be based on this foundation.