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1. Multi‑Scale Primality Framework

1. Resolution Levels

Discrete scales .

Surjections for .

2. Scale‑Resolved Networks

G^{(k)}=(V^{(k)},E^{(k)},\ell^{(k)},h^{(k)},J^{(k)})

is the length metric.

is the logical‑entropy field.

satisfies .

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2. Geodesic Paths

Definition. A path in is a geodesic if

Directional Derivative. Along ,

D\_\gamma h^{(k)}(v)

= \lim\_{\delta\to0^+}

\frac{h^{(k)}\bigl(\gamma(s+\delta)\bigr)

-h^{(k)}\bigl(\gamma(s-\delta)\bigr)}

{2\,\delta}\quad

\text{at } \gamma(s)=v.

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3. Event‑Horizon Boundary

1. Flux Threshold .

2. Horizon Set

\mathcal{H}^{(k)}

= \bigl\{\,v\in V^{(k)} \mid

\exists\,\text{geodesic }\gamma\ni v:\;

\sum\_{e\in\gamma}J^{(k)}(e)\ge\Xi\_k

\bigr\}.

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4. Epiphany Event

A triple is an epiphany if all hold:

1. Horizon Crossing

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2. Sign Reversal

D\_\gamma h^{(k)}\bigl(v^\*,t^\*-\epsilon\bigr)

\times

D\_\gamma h^{(k)}\bigl(v^\*,t^\*+\epsilon\bigr)

<0.

3. Intensity Threshold

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5. Key Properties

Local & Irreversible: Only the immediate neighborhood of updates; smoothing cannot undo.

Scale Cascade: Epiphany at induces corresponding events at via , within .

Intensity Measure

I(v^\*,k,t^\*)

=\bigl|D\_\gamma h^{(k)}\bigr|

\times\exp\!\bigl(-\alpha\,d^{(k)}(v^\*,\mathcal{W})\bigr).

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6. Update Mechanism

Upon :

1. Edge‑Weight Adjustment: Increase weights on edges of near .

2. Local Primality Descent: Reapply and at scale around .

3. Wisdom Increment:

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7. Implementation Steps

1. Construct for each scale .

2. Identify by thresholding .

3. Monitor along candidate geodesics.

4. Detect epiphanies when both sign flip and are met.

5. Apply update mechanism and record .

6. Iterate until no new epiphanies occur at any scale.

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This high‑resolution, streamlined format captures epiphany as an atomic, geometry‑driven insight in the Primality network—ready for rigorous proof and efficient simulation.