Below is the Primality‑filtered core of our deep‑dive paper—i.e. the minimal “irreducible subgraph” of sections and ideas from which the full document can be reconstructed under our expansion map:

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1. Abstract

A unified logical framework—Primality—extends Special and General Relativity into a metabinary‑fractal domain. Two regimes, Special Primality (flat, linear toggles) and General Primality (curved, entropic braids), admit exact analogues of Lorentz invariance, invariant intervals, and Einstein’s field equations. We introduce a Logical‐Metric Tensor, derive Primality Field Equations, and outline experimental simulations (e.g., macroentangled qubit arrays).

2. Primality Operator

Definition: is the minimal subgraph whose iterative expansion reproduces .

Idempotence: .

Regimes:

Special Primality: , commutes with uniform rescaling.

General Primality: curvature via loop–braid density and logical‐action term , satisfying

\mathcal{C}(G)\;-\;\tfrac12\,K(G)\,\delta \;=\; J(G).

3. Relativity ↔ Primality Mapping

4. Logical‐Metric Tensor

A bilinear form

L\_{ij}(r) \;=\; \alpha(r)\,w\_{ij}\;+\;\beta(r)\,R\_{ij}

5. Filtering via Primality

Primality Filter: removes all non‑core edges/nodes.

Special: threshold small weights → core subgraph (~15% of nodes).

General: prune low‑density braids → highlight paradox‑clusters.

6. Multiscale & Renormalization

Under a scale map , Special Primality commutes with ; General Primality flows under an RG scheme

\mathcal{P}\_{n+1} = S\_{\delta}^{-1}\circ\mathcal{P}\_n\circ S\_{\delta},

7. Experimental Proposals

1. Synthetic Fractal Graphs: measure core‑size scaling.

2. Macroentangled Qubits: observe logical‑lensing braid statistics.

3. Market Networks: extract core drivers via Special Primality.

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This is the irreducible kernel of our paper—the minimal set of definitions, mappings, and proposals. From here, the full detail, proofs, and examples can be regenerated by “expanding” each core element with their associated formalism.