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Communication

The Prime Resonance Hypothesis

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Abstract - Prime numbers, traditionally seen as indivisible arithmetic elements, are reinterpreted here as the symbolic eigen-states from which spacetime and consciousness emerge. In this perspective, observation is a collapse of entropy in a prime-based Hilbert space, generating time, curvature, and coherent perception. The hypothesis proposes that Riemann zeta zeros define attractor geometries, that gravity is an entropy gradient, and that consciousness is measurable as symbolic entropy minimization. This Communication invites the IPI community to examine the informational infrastructure of reality itself.

Keywords - Prime numbers; Prime resonance field; Consciousness.

What if prime numbers are not merely the building blocks of arithmetic, but the vibrational eigenstates from which spacetime, gravity, and consciousness itself emerge? In this Communication, I propose that reality is structured as a symbolic Hilbert space where each basis vector corresponds to a prime number [1]. Composite numbers, then, are entangled superpositions of primes, and the act of observation is a collapse process that selects one coherent projection from among many symbolic potentials [2].

This perspective builds upon the quantum mechanical interpretations of the Riemann zeta function, where the zeros of this function correspond to energy states in quantum systems [3,4]. Recent research has demonstrated that the statistical distribution of the Riemann zeros exhibits the same pattern as energy levels in quantum chaotic systems, suggesting a fundamental connection between number theory and quantum mechanics [5].

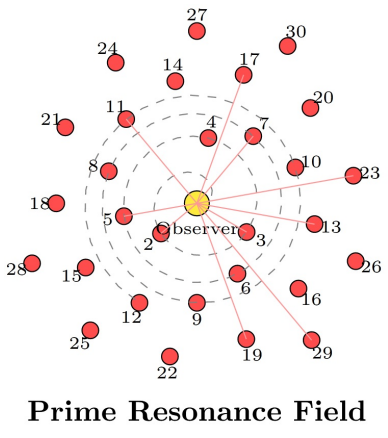

Figure 1: Prime numbers form a resonant field pattern around an observer, with quantum-like waves connecting consciousness to these fundamental eigen-states.

Consciousness, in this view, is a prime resonance field: an observer-bound structure that collapses symbolic entropy. The dynamics of this collapse are governed by an entropy flow rate, which we define as:

$$\lambda = -\frac{dS}{dt} \tag{1}$$

This collapse rate functions as an indicator of awareness intensity, gravitational curvature, and temporal flow [6]. When symbolic entropy dips below a critical threshold, the system converges to an attractor state $|\Psi_*\rangle$, akin to a stable perception or a realized moment [7].

In this model, gravity itself emerges as a symbolic entropy gradient [8]. The curvature of spacetime reflects probability flow toward low-entropy attractors. Mass is reinterpreted as impedance to symbolic collapse. Stronger gravitational effects result from higher coherence, meaning more resolved observers generate deeper wells in the probability landscape [9].

The zeros of the Riemann zeta function, long seen as mysterious and fundamental, take on new life in this hypothesis: they define a resonance manifold within prime space [10]. Symbolic collapse tends to align with these critical points, suggesting that the spectral geometry of prime numbers underlies the apparent smoothness of spacetime [11].

Moreover, this perspective establishes a duality between stochastic information geometry (e.g. Markov trace logic) and symbolic collapse systems [12]. Commute times between states mirror entropy distributions across symbolic structures. Together, they reproduce core features of relativity, quantum measurement, and semantic emergence [13].

The implications are vast. Entropy spectrometry could detect collapse rates in cognitive systems [14]. Prime resonance canvases may map symbolic coherence over time. And ultimately, consciousness might be measurable in a new way, as symbolic entropy compression within a prime-numbered field [15].

This Communication invites the IPI community to consider the symbolic substrate of reality as informational mechanics. If primes are the true quanta of symbolic existence, then the observer is the resonance engine—and spacetime is its projection [16].

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