

Fractal Causality: Conceptual Framework (v2)

This document presents the refined conceptual narrative of Fractal Causality (FC). It avoids speculative language and focuses on testable, physical intuition. The model centers on Continuous Quantum Bursts (CQBs) and the Law of Expansion (LOE), organized as hypotheses to be investigated rather than asserted facts.

1. Core Idea

Fractal Causality proposes that structure and dynamics in the universe are shaped by recurring bursts of energy or information—termed Continuous Quantum Bursts (CQBs)— which interact with the broader Law of Expansion (LOE). Together, these define a repeating yet evolving cosmic system.

2. Hypotheses

- (a) The LOE acts as a conveyor, driving expansion and directional flow of cosmic evolution.
- (b) CQBs provide localized injections of energy, potentially observable as oscillatory or periodic features in cosmological data.
- (c) Black holes serve as sinks and recyclers, coupling to the CQB-LOE framework in a closed loop.

3. Observables

The model suggests testable imprints:

- Oscillatory residuals in galaxy clustering and power spectra.
- Phase-coherent signals in bispectrum analyses.
- Correlated anomalies in gravitational-wave backgrounds.
- Possible frequency correlations in optical-clock networks.

4. Distinction from Standard Models

Unlike the singular Big Bang picture, FC emphasizes ongoing dynamical creation within a self-sustaining circuit. It aims to complement, not discard, Λ CDM, by offering specific signatures for experimental tests.

5. Next Steps

The model requires formal mathematical development, mock data injection tests, and comparison against survey data (BOSS, DESI, Planck, LVK). This framework is not yet proof, but an invitation for rigorous testing and refinement.