**The Last Signal: A Hypothesis on Consciousness Collapse at Death**

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**Abstract**

This paper explores a novel hypothesis regarding the fate of consciousness at the moment of death, proposing that neural activity does not simply “cease” but follows a structured collapse analogous to gravitational singularities and resonance decay. Integrating principles from neuroscience, quantum mechanics, and thermodynamics, this model suggests that death induces a final coherence event—a localized “black hole-like” state—before rapid information dispersal. This process could explain near-death experiences, final neural spikes, and the subjective perception of time dilation. We propose potential experimental tests to evaluate this hypothesis, bridging physics and cognitive science in a new model of consciousness.

## 1. Introduction

Traditional neuroscience posits that consciousness ceases upon neural failure, but this perspective lacks a structured model of what happens **in the final moments** of awareness. The **Last Signal Hypothesis** proposes that:

1. **Consciousness follows structured resonance principles** rather than binary on/off states.
2. **At the moment of death, neural activity collapses into a final coherence event**, akin to black hole formation in physics.
3. **This collapse follows a specific energy dissipation pattern**, potentially explaining reports of time dilation, near-death visions, and end-of-life brain surges.

This paper outlines the **physics of cognitive collapse**, drawing from **neural resonance models**, **phase transitions**, and **entropy dynamics** to propose a new testable framework for consciousness at death.

## 2. Theoretical Basis

### 2.1. Consciousness as Resonant Structure

CODES (Chirality of Dynamic Emergent Systems) posits that **consciousness is not a static property but an emergent resonance**. Neural firing synchronizes in phase-locked states, forming coherence patterns over time.

- **Death disrupts this phase-locking**, but instead of a sudden termination, the system undergoes **a structured decay**, much like how stars collapse into black holes.

- **Key prediction:** If consciousness follows resonance principles, the final moments of life should **maximize coherence briefly before total dissipation**.

### 2.2. The Black Hole Analogy

A black hole forms when gravitational collapse passes the Schwarzschild radius, trapping information within an event horizon. We propose an **analogous process occurs in the brain**:

- **Neural information collapses inward**, forming a transient information sink.
- Subjective time dilation may occur, **consistent with end-of-life brain surges**.
- The collapse ends with a rapid "evaporation" of information akin to **Hawking radiation**.

### 2.3. Thermodynamics & Information Dissipation

- **Second Law of Thermodynamics**: At death, metabolic energy disperses, but information density **momentarily peaks** before dispersal.
- **EEG Data**: Patients have exhibited last-moment **gamma wave bursts** in near-death states, supporting this structured collapse model.

## 3. Empirical Predictions & Tests

### 3.1. EEG & fMRI Observations

We predict a **signature pattern** in end-of-life brain waves:

✅ **A final coherence peak** (gamma wave spike)

✅ **Brief ultra-high synchrony** across cortical networks

✅ **Rapid energy dispersal post-collapse**

### 3.2. Quantum Coherence Experiments

If consciousness involves quantum effects (Penrose-Hameroff Orch-OR model), death should induce a **final decoherence event**, measurable via **low-temperature neuron ion trap studies**.

### 3.3. Subjective Time Dilation Reports

Near-death experiences often involve **time distortion**. This could be tested by:

- Comparing real-time EEG spikes with retrospective patient reports.
- Analyzing **time perception anomalies in cardiac arrest survivors**.

**4. Implications & Future Research**

✅ **Neuroscience:** Understanding final cognitive states as structured phase transitions.

✅ **Physics:** Investigating consciousness collapse as an energy singularity event.

✅ **Philosophy:** A new non-dualistic model of death that preserves **physical information integrity**.

**5. Conclusion**

The **Last Signal Hypothesis** presents a novel view of consciousness at death, proposing a structured resonance collapse rather than an abrupt cessation. This model bridges neuroscience, quantum mechanics, and entropy physics, offering a **new empirical frontier** for the study of cognition and mortality.

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This bibliography provides a foundation for **scientific legitimacy**, drawing from **neuroscience, quantum mechanics, entropy physics, and philosophy of mind**.