The Quantum Hybrid Fallacy: On the Ontological Limits of Classical–Quantum Integration

Why Hybrid Quantum-Classical Systems Fail by Design

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Abstract

This paper extends the frameworks introduced in The Five Primitives and P vs NP as a Compactification Problem to examine the structural impossibility of coherent quantum–classical integration. The so-called "quantum hybrid computer" is not merely a technological challenge but an ontological contradiction—a system attempting to synchronize entities that operate in mutually exclusive dimensional regimes.

Quantum computation unfolds within a pre-topological amplitude field (∞-mode), whereas classical architectures require discretized enclosure (3-mode). Any bridging layer—clock, interface, or pipe—necessarily invokes the annihilative 0-mode, collapsing coherence into noise.

This analysis is theoretical and ontological, not an empirical prediction of engineering outcomes. It concerns the internal consistency of hybrid models rather than their provisional experimental realizations.

Keywords: quantum ontology, hybrid computation, modal collapse, decoherence, ∞–0 bridge, synchronization, structural paradox, dimensional constraint.

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1. The Synchronization Paradox

Classical computation depends on temporal regularity: a global clock enforces causal order. Quantum systems, however, evolve unitarily in superposed amplitude space—time there is implicit in phase relation, not external sequencing.

When classical logic attempts to synchronize with that manifold, it injects a clock pulse—an artificial periodic boundary that forces collapse through 0. Each tick is an annihilative act that converts latent potential into manifest state, thus breaking superposition.

Hybrid systems therefore oscillate between coherence and erasure: the very mechanism of synchronization guarantees periodic decoherence.

2. Ontological Misalignment of Modes

Mode	**Dimensional Regime**	**Quantum Analog**	**Classical Analog**	**Failure Point**
∞	Latent field (pre-topological)	Superposition manifold	Not representable	Non-local adjacency
1	Substance instantiation	Qubit amplitude	Logical unit	Collapse required for mapping
2	Relational scaffold	Entanglement	Bus / pipe	Violates causal locality
3	Enclosed stability	Decohered state	Computed result	Static manifold; external clock
0	Bridge / void	Measurement collapse	Reset	Entropy max; coherence loss

Quantum and classical modes are not faster or slower versions of one another—they are ontologically distinct operators. The former encodes relation without location; the latter enforces location without relation. Their interface, therefore, is a zero-bridge: destructive by definition.

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3. Clock and Pipe as Ontological Artifacts

In The Five Primitives, the shift ∞ → 1 introduced selection; 1 → 2 introduced relation; 2 → 3 introduced stability.
A clock is a 3-mode device enforcing regular enclosure; a pipe is a 2-mode structure transmitting bounded relation.

Quantum computation operates in the ∞–1–2 domain—adjacency through phase, not enclosure. Imposing a 3-mode control layer on that regime enacts forced collapse. The interface, acting as 0, destroys what it measures.

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4. Analog Speculation and the Markov Limit

Analog computation occupies the threshold between 1 and 2: continuous but bounded. It approaches quantum adjacency without full superposition. Its effective latency trends toward zero, not through speed, but through non-temporal propagation.

If quantum computation behaves analogically, compute time becomes meaningless—execution occurs in potential, not sequence. Yet observation reintroduces 0; output re-instantiates classical temporality. Thus, even analog bridging is cyclic collapse masquerading as continuity.

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5. Structural Implications

- **Control**: Classical control presumes bounded causality; quantum evolution negates that presumption.
- **Transport**: "Quantum pipe" is self-contradictory; pipe implies distance, quantum adjacency abolishes it.
- **Synchronization**: Shared clock ⇒ periodic collapse. Time itself is a 3-mode artifact incompatible with ∞-mode dynamics.
- **Entropy**: Every traversal through 0 resets informational order, imposing an energy cost equal to erasure.

Hybridization is therefore not limited by error correction but by modal incoherence—a fundamental mismatch in dimensional grammar.

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6. Dimensional Reframing

Within the Five-Primitives ontology:

$$Quantum\ regime\colon\ \infty \to 1 \to 2, \qquad Classical\ regime\colon\ 1 \to 2 \to 3, \qquad Bridge\colon\ 0$$

Their intersection yields annihilation. Genuine integration would require a higher-order manifold—perhaps a 4-mode temporal envelope (3 + ∞-duration)—capable of simultaneous latency and stability. Until such a structure is realized, hybrid systems will remain oscillatory: coherence consumed at the point of translation.

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7. Conclusion: The Fallacy of Coexistence

The Quantum Hybrid Fallacy is the assumption that potential (∞) and presence (3) can coexist within a single coherent system. Yet their union always passes through 0, the bridge of annihilation.

The boundary between amplitude and clock is not a zone of integration but of dissolution. The question is not whether hybrid computing will work, but whether its conceptual foundations respect the ontological grammar of existence itself.

Quantum computing may succeed as a distinct mode; hybrid computing, by its very structure, cannot achieve coherent unification.