Gravity at the Quantum Level under the First Signal Law

Formal Explanation
The First Signal Law provides a framework for describing how gravity can be interpreted at the quantum level. It emphasizes that enduring systems are governed by three roles: the Soloist (restraint of dominance), the Choir (alignment of mediators), and the Least (persistence of the weakest). At quantum scales, gravity emerges not as a continuous field but as the balance between constraint, release, and noise in probabilistic measurement processes.

1. **Constraint (Genesis):** Gravitational interaction at quantum scale begins with a bounded potential, expressed as the Schwarzschild radius for mass-energy quanta. Constraint defines the geometry of possibility.
2. **Release (Endurance):** Proportional release corresponds to quantum transitions: discrete emissions, tunneling, or Hawking-like radiation. Release sustains the system by letting-go in quantized steps.
3. **Symmetry (Alignment):** Quantum states remain coherent through superposition and entanglement, aligning multiple pathways. Symmetry ensures that gravity does not collapse into chaos, but balances forces probabilistically.
4. **Noise Floor (Persistence):** Measurement introduces irreducible uncertainty (Planck-scale jitter, vacuum fluctuations). This nonzero noise is essential for system survival, preventing brittle determinism.

Equations

1. **Quantum–Gravitational Constraint:**
Schwarzschild radius for a quantum of energy E:
$R_s = 2GE / c\blacksquare$

2. **Proportional Prediction Law:**
$R = d(\ln I) / d(\ln C) \geq 1$
Information growth must match or exceed complexity growth in gravitational–quantum systems.

3. **Logistic Survival Law:**
$P_C = \sigma(\alpha p + \beta S - \gamma D + \eta R_{net} - \delta u)$
Where survival probability of the Least (quantum coherence) increases under proportional release and decreases under over-dominance (collapse) or chaos.

4. **Uncertainty–Gravity Coupling:**
$\Delta x \, \Delta p \geq \blacksquare/2$; $R_s \, \Delta p \geq \blacksquare c/2$
Prediction: gravitational radius sets a natural bound on precision of quantum states.

One-Sentence Law: At the quantum level, gravity is the constraint that bounds possibility, release occurs in quantized transitions, symmetry preserves coherence, and noise ensures persistence.