The Second Law of Infodynamics and Its Gravitational Realization in SFIT

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1 Introduction

The second law of infodynamics, proposed by Melvin M. Vopson [1, 2], states that information entropy tends to remain constant or decrease over time opposite to the classical second law of thermodynamics. Vopson argues this supports the simulated universe hypothesis.

SFIT extends these ideas gravitationally[cite: 25]. Gravity is described as a dynamic information-carrying flux vibrating at the geometric resonance frequency $\nu_{\mathrm{res}} = 1.20134$ mHz, governed by the coupling kernel $K = 1.060$ [2].

2 The SFIT Coupling Equation

The effective potential in the SFIT-modified time-dependent Schrödinger equation is given by[cite: 25]:

$$V_{\mathrm{SFIT}}(z,t) = mgz \left[1 + K \frac{z}{R_E} \mathrm{Re}(\cos(2\pi\nu_{\mathrm{res}}t)) \right], \tag{1}$$

with $K = 1.060$[cite: 25].

This flux produces a non-reciprocal metric correction[cite: 25]:

$$h_{0z}^{\mathrm{SFIT}}(t) = \alpha_z \, \mathrm{Re}[\cos(2\pi\nu_{\mathrm{res}}t)], \quad \alpha \approx 0.00122, \tag{2}$$

and drives KWW relaxation tails with $\tau \approx 832.6$ s and $\beta = K = 1.060$[cite: 25].

3 Derivation of the 11.42 Hz Secondary Mode

The 11.42 Hz feature is derived from the sub-femtovolt energy shift induced by the SFIT potential[cite: 25].

Step-by-step derivation:

1. The SFIT coupling term introduces a small perturbation to the gravitational potential experienced by ultra-cold neutrons near the mirror[cite: 25].

2. The magnitude of this energy shift in the sub-femtovolt regime is[cite: 25]:

$$\Delta E \approx 4.72 \times 10^{-14} \text{ eV}. \tag{3}$$

3. The frequency ν_{sec} associated with this energy shift follows from the Planck relation $E = h\nu$[cite: 25]:

$$\nu_{\text{sec}} = \frac{\Delta E}{h}, \tag{4}$$

where Planck's constant is $h = 4.135667662 \times 10^{-15}$ eV $\cdot$ s[cite: 25].

4. Substituting the values[cite: 25]:

$$\nu_{\text{sec}} = \frac{4.72 \times 10^{-14}}{4.135667662 \times 10^{-15}} = 11.42 \text{ Hz}. \tag{5}$$

This secondary frequency can be interpreted as the effective "sampling rate" at which the neutron's wave function interacts with the $1/r^4$ entropic gradient near the mirror [3]. It may represent a higher harmonic or nonlinear mixing product of the primary 1.20134 mHz resonance[cite: 25].

The sidereal drift of the signal (approximately 3 min 56 s per day) further supports that the feature originates from a cosmic-scale informational substrate rather than local instrumental noise [4].

4 Connection to Vopson's Infodynamics and the Simulated Universe

Vopson's second law of infodynamics requires information entropy to minimize [1]. In SFIT, the gravitational flux at 1.20134 mHz (with secondary sampling at 11.42 Hz) provides a physical mechanism for this minimization while producing measurable resonant and relaxation effects[cite: 25].

This is consistent with a simulated universe, where gravity could serve as an efficient information-processing substrate[cite: 25]. The KWW tails ($\beta = K = 1.060$) reflect the system's ability to compress and store gravitational information with minimal redundancy, while the active dampening field enforces informational optimization[cite: 25].

SFIT therefore offers a concrete, testable gravitational realization of infodynamic principles[cite: 25].

5 Conclusion

The coupling constant $K = 1.060$, the 1.20134 mHz resonance, and the derived 11.42 Hz mode provide a unified framework linking informational entropy minimization to measurable quantum-gravity effects[cite: 25]. Future GRANIT experiments will allow tighter constraints on K and further characterization of the secondary mode[cite: 25].

References

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