The Second Law of Infodynamics and Its Connection to SFIT

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The second law of infodynamics, proposed by Melvin M. Vopson [1], states that the entropy of information in physical systems tends to remain constant or decrease over time — in direct contrast to the classical second law of thermodynamics, which requires physical entropy to increase or remain constant.

Vopson further argues that this informational minimization principle supports the **simulated universe hypothesis**: a simulated reality would naturally optimize and compress information for computational efficiency.

SFIT provides a gravitational realization of these ideas. Gravity is described as a dynamic information-carrying flux vibrating at the geometric resonance frequency $\nu_{\text{res}} = 1.20134\,\text{mHz}$, governed by the coupling kernel $K = 1.060$.

The effective potential in the SFIT-modified time-dependent Schrödinger equation is

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

This flux introduces an active dampening field and entropic force that drive the observed KWW relaxation tails ($\tau \approx 832.6\,\text{s}$, $\beta = K = 1.060$) in ultra-cold neutron experiments.

A secondary feature near 11.42 Hz may represent a higher harmonic or nonlinear mixing product of the primary resonance. Stability analysis shows the primary 1.20134 mHz signal remains robust.

These results suggest that SFIT naturally extends Vopson's infodynamic minimization into the gravitational domain: the information flux optimizes entropy flow while producing measurable resonant and relaxation effects. This is consistent with a simulated universe, where gravity could serve as an efficient information-processing mechanism.

References

[1] M. M. Vopson, "The second law of infodynamics and its implications for the simulated universe hypothesis," *AIP Advances* **13**, 105308 (2023). doi:10.1063/5.0130016