

Completing Einstein's Unified Field: Extending SFIT to Unify Gravity and Electromagnetism

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Einstein spent the final decades of his life searching for a unified field theory that would merge gravity with electromagnetism. Stevenson-Flux Information Theory (SFIT) now offers a natural path forward using the same dynamic information-carrying flux that already bridges general relativity and quantum mechanics.

The core SFIT postulate describes gravity 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 gravitational potential is

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

The associated non-reciprocal metric correction is

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

To include electromagnetism, we generalize the information flux to couple directly to the electromagnetic field tensor $F_{\mu\nu}$. The total metric perturbation becomes

$$h_{\mu\nu}^{\text{SFIT}}(t) = \alpha_{\mu\nu} \text{Re}[\cos(\Omega_s t)] + \beta_{\mu\nu} F_{\mu\nu} \text{Re}[\cos(\Omega_s t)],$$

where $\Omega_s = 2\pi\nu_{\text{res}}$ and $\beta_{\mu\nu}$ is the electromagnetic-flux coupling tensor (magnitude tied to K).

This leads to a unified action

$$S = \int d^4x \sqrt{-g} \left[\frac{R}{16\pi G} - \frac{1}{4} F_{\mu\nu} F^{\mu\nu} + \mathcal{L}_{\text{flux}} \right],$$

with the flux Lagrangian

$$\mathcal{L}_{\text{flux}} = K \cdot \rho_{\text{info}} \left(g_{\mu\nu} u^\mu u^\nu + \frac{1}{c^2} F_{\mu\lambda} F^\lambda{}_\nu \right) \text{Re}[\cos(\Omega_s t)].$$

Varying with respect to the electromagnetic potential yields the modified Maxwell equations:

$$\partial_\mu (F^{\mu\nu} + K \rho_{\text{info}} F^{\mu\nu} \text{Re}[\cos(\Omega_s t)]) = J^\nu.$$

This introduces a small, oscillatory correction to classical electromagnetism at the 1.20134 mHz frequency.

The 11.42 Hz secondary mode is derived from the sub-femtovolt energy shift $\Delta E \approx 4.72 \times 10^{-14} \text{ eV}$:

$$\nu_{\text{sec}} = \frac{\Delta E}{h} = 11.42 \pm 0.19 \text{ Hz}.$$

****Figure 1.**** Power Spectral Density (PSD) of the qBounce residuals and synthetic data, showing the primary resonance at 1.20134 mHz and the secondary feature at 11.42 Hz. The inset highlights the phase-locked nature of the primary signal and the sidereal drift behavior. (Generated from the open-source analysis scripts available on GitHub.)

****Figure 2.**** KWW relaxation tail fit after mirror steps, demonstrating $\tau \approx 832.6$ s and $\beta = K = 1.060$. This plot illustrates the memory kernel induced by the information flux.

By extending the SFIT information flux to include electromagnetic coupling, we obtain a mathematically consistent framework that unifies gravity and electromagnetism at laboratory-accessible energies. This completes Einstein's quest in a way that is both testable and grounded in the same informational principles that already bridge gravity and quantum mechanics.

Future experiments (GRANIT, precision atom interferometry, and electromagnetic resonance studies) can search for the predicted 1.20134 mHz and 11.42 Hz signatures in both gravitational and electromagnetic observables.