March 5, 2025

Dear Editor,

I am pleased to submit my manuscript, "Temporal Flow Theory: Unifying Time, Quantum Mechanics, and Cosmology via Entanglement Entropy," for consideration as a Letter in *Physical Review D*. This work introduces Temporal Flow Theory (TFT), a novel framework that redefines time as a dynamic four-vector field W^μ driven by entanglement entropy gradients. TFT unifies quantum mechanics, gravity, and cosmology. It addresses key challenges including the quantum measurement problem and dark matter phenomenology. Additionally, it tackles the black hole information paradox and the Hubble tension ($H_0 = 70.5 \pm 0.7\,\mathrm{km/s/Mpc}$).

Using TempFlowSim (TFS-2025-v1.3), a numerical simulation tool, TFT predicts testable outcomes such as quantum interference shifts ($\Delta\phi \approx 2.1\times10^{-6}$ rad) and cosmological expansion consistent with DESI and SH0ES data. A sample quantum-scale dataset supporting these findings is available at `https://github.com/Mwpayne01/TempFlowSim`, adhering to FAIR principles. Unlike ΛCDM or MOND, TFT's minimal parameter set offers a fresh perspective on spacetime's fundamental nature, with broad implications for physics.

Given PRD's readership in quantum gravity, cosmology, and computational physics, I believe this interdisciplinary study aligns well with the journal's scope. The manuscript includes 26 references and uses PhySH terms such as "Entanglement," "Cosmological Parameters," and "Quantum Gravity" to reflect its content. I have no conflicts of interest to declare and suggest reviewers with expertise in quantum entanglement and cosmology, if needed.

TFT's suitability as a PRD Letter stems from its groundbreaking unification of time, quantum mechanics, and cosmology via entanglement entropy, addressing key challenges like the Hubble tension and quantum measurement problem. Its novel, testable predictions—e.g., quantum interference shifts ($\Delta\phi \approx 2.1 \times 10^{-6}$ rad)—and validation via TempFlowSim simulations make it a timely, impactful contribution. This concise, interdisciplinary advance fits PRD Letters' focus on significant, cutting-edge results, appealing to its readership with fresh insights and experimental potential.

Thank you for considering this submission. I look forward to the review process.

Sincerely, Matthew Warren Payne
Independent Researcher
Email: Matthew.payne@sfr.fr
ORCID: 0009-0009-5818-7238