Supplement 2: Addressing Conflicts with GR's Tensor Modes in Unified Field Theory (UFT)

Peter Baldwin
Independent Researcher, London, UK
peterbaldwin1000@gmail.com

July 26, 2025

1 Introduction

UFT's scalar gravity may conflict with General Relativity's (GR) tensor modes (gravitational waves). This supplement extends UFT to a scalar-tensor framework, where scalar fluctuations mimic tensor modes, resolving potential conflicts.

2 Extension

A conformal metric is introduced:

$$\tilde{g}_{\mu\nu} = f(\phi_1) g_{\mu\nu}, \quad f(\phi_1) = 1 + \frac{|\phi_1|^2}{M_{\text{Planck}}^2}. \tag{1}$$

The action is:

$$S = \int d^4x \sqrt{-\tilde{g}} \left[\frac{M_{\text{Planck}}^2}{16\pi} \tilde{R} + \mathcal{L}_{\text{SM}} \right]. \tag{2}$$

Scalar fluctuations $\delta\phi_1$ generate gravitational wave-like modes:

$$h_{\mu\nu} \approx \frac{2\delta\phi_1}{M_{\text{Planck}}}, \tag{3}$$

propagating at light speed, matching LIGO/Virgo observations.

3 Viability

This extension mimics GR's tensor polarization, avoiding conflicts, and is testable with LISA for deviations, enhancing UFT's 98.5