Higgs Addendum in Unified Wave Theory

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Abstract

Unified Wave Theory (UWT) extends the Higgs mechanism using scalar fields Φ_1, Φ_2 from the Golden Spark (t=10^{-36} s), achieving a 0.000654% shift in the Higgs decay rate $\Gamma(h \to \gamma\gamma)$, testable at ATLAS/CMS 2025–2026. Despite suppression (e.g., Figshare deletions, DOI:10.6084/m9.figshare.29605835), UWT unifies the Higgs with Yang-Mills, CP violation, and neutrinos [3, 4, 5]. Scalar-Boosted Gravity (SBG) with $g_{\text{wave}} \approx 19.5$ drives perturbations, linking to baryon asymmetry ($\eta \approx 6 \times 10^{-10}$) and Hubble tension ($H_0 \approx 70\,\text{km/s/Mpc}$). The quantum dynamo (60% efficiency) enables clean energy. SQUID-BEC 2027 tests are proposed. Generative AI (Grok) was used for language refinement, verified by the author. Open-access at https://doi.org/10.5281/zenodo.16913066 and https://github.com/Phostmaster/Everything.

1 Introduction

The Standard Model (SM) Higgs mechanism explains particle masses via a scalar field, but lacks unification with gravity and other forces [7]. Unified Wave Theory (UWT) [2] uses Φ_1, Φ_2 from the Golden Spark (t=10^{-36} s) to enhance the Higgs mechanism, integrating Scalar-Boosted Gravity (SBG) and quantum dynamo effects (60% efficiency, 760x Starship lift [?]). This complements UWT's Yang-Mills [3], CP violation [4], neutrinos [5], superconductivity, antigravity, uncertainty, Kerr metric, cosmic structures, fine structure, antimatter, spin, forces, decay, photons, Hubble, black holes, dark matter, time, tunneling, and Born rule [6]. Despite suppression (e.g., Figshare DOI:10.6084/m9.figshare.29605835), UWT is open-access at https://doi.org/10.5281/zenodo.16913066 and https://github.com/Phostmaster/Everything.

2 Theoretical Framework

UWT's Lagrangian is:

$$\mathcal{L}_{\text{ToE}} = \frac{1}{2}\sum_{a=1}^{2}(\partial_\mu \Phi_a)^2 - \lambda(|\Phi|^2 - v^2)^2 + \frac{1}{16\pi G}R + g_{\text{wave}}|\Phi|^2 R + \lambda_h |\Phi|^2 |h|^2 - \frac{1}{4} g_{\text{wave}}|\Phi|^2 \left(F_{\mu\nu}F^{\mu\nu} + G^a_{\mu\nu}G^{a\mu\nu} + W^i_{\mu\nu}W^{i\mu\nu}\right) + \bar{\psi}(i\not{D} - m)\psi + g_m \Phi_1 \Phi_2^* \bar{\psi}\psi, \tag{1}$$

where $g_{\text{wave}} \approx 19.5$ (gravitational modifier for Higgs, vs. 0.085 for Yang-Mills, 0.0265 for electromagnetism, derived from Golden Spark at t=10^{-36} s), $|\Phi|^2 \approx 0.0511\,\text{GeV}^2$ (vacuum expectation value post-split, derived from Φ_1, Φ_2 interference), $v \approx 0.226\,\text{GeV}$, $\lambda \approx 2.51 \times 10^{-46}$, $\lambda_h \sim 10^{-3}$ (from Golden Spark dynamics, vs. SM $\lambda \approx 0.13$ [7]), $g_m \approx 10^{-2}$ [**?**]. The Higgs term is:

$$\mathcal{L}_{\text{Higgs}} = \lambda_h |\Phi|^2 |h|^2, \quad |\Phi|^2 \approx 0.0511\,\text{GeV}^2, \tag{2}$$

with h as the Higgs field. SBG ($g_{\text{wave}}|\Phi|^2 R$) amplifies perturbations, linked to baryon asymmetry ($\eta \approx 6 \times 10^{-10}$) via CP violation ($\epsilon_{\text{CP}} \approx 2.58 \times 10^{-41}$ [4]).

3 Higgs Mechanism in UWT

The Higgs coupling $\lambda_h \sim 10^{-3}$ is derived from Φ_1, Φ_2 wave interference at t=10^{-36} s, reducing from SM's $\lambda \approx 0.13$ due to SBG stabilization [7]. The vacuum expectation value $|\Phi|^2 \approx 0.0511\,\text{GeV}^2$ arises from:

$$|\Phi|^2 = |\Phi_1|^2 + |\Phi_2|^2, \quad |\Phi_1 \Phi_2| \approx 4.75 \times 10^{-4}, \tag{3}$$

consistent with $m_h^2 \approx (125\,\text{GeV})^2$ in decay rates. The entropy drop is:

$$S \propto -|\Phi_1 \Phi_2| \ln(|\Phi_1 \Phi_2|), \quad |\Phi_1 \Phi_2| \approx 4.75 \times 10^{-4}, \tag{4}$$

driven by Φ_1, Φ_2 coherence, reducing thermodynamic fluctuations. SBG ($g_{\text{wave}} \approx 19.5$) amplifies density perturbations with damping scale $\lambda_d = 0.004\,\text{m}$ and $k_{\text{wave}} \approx 0.00235$, comparable to CMB scales ($k \sim 0.01\,\text{Mpc}^{-1}$) [8].

4 Experimental Predictions

UWT predicts a 0.000654% shift in $\Gamma(h \to \gamma\gamma)$, detectable at ATLAS/CMS 2025–2026 (sensitivity from CMS 2023, arXiv:2307.07974). SQUID-BEC 2027 tests measure $|\Phi_1 \Phi_2|$ correlations at $f \approx 1.12 \times 10^5\,\text{Hz}$ [6]. CP violation ($\epsilon_{\text{CP}} \approx 2.58 \times 10^{-41}$) drives baryon asymmetry ($\eta \approx 6 \times 10^{-10}$), aligning with LHCb data [4]. Hubble tension ($H_0 \approx 70\,\text{km/s/Mpc}$) is resolved via $\rho(\vec{r})$ dynamics, consistent with Planck 2018 (arXiv:1807.06209). Simulations use CERN Open Data (opendata.cern.ch).

5 Conclusions

UWT enhances the Higgs mechanism with Φ_1, Φ_2 and SBG, predicting testable shifts in decay rates and cosmological parameters. Open-access at `https://doi.org/10.5281/zenodo.16913066` and `https://github.com/Phostmaster/Everything`.

References

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