Strong-Field Gravity in Unified Wave Theory: Neutron Stars and the Golden Spark

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Abstract

Unified Wave Theory (UWT) models strong-field gravity in neutron stars using the Golden Spark at $t \approx 10^{-36}$ s, splitting Φ into Φ_1, Φ_2, with Scalar-Boosted Gravity (SBG, $g_{\text{wave}} \approx 19.5$) and entropy drop replacing dark matter (DM). Bose-Einstein condensate (BEC) tests measure Φ_1, Φ_2 coherence, targeting 4σ. Simulations align with CMB ($\delta T/T \approx 10^{-5}$) and BAO, validated via DESY.

1 Introduction

Neutron stars test strong-field gravity (**?**). UWT's Golden Spark uses Φ_1, Φ_2 to model non-collapse dynamics, eliminating DM.

2 Methodology

The Golden Spark seeds:

$$|\Psi\rangle = \frac{1}{\sqrt{2}}(|\Phi_1\rangle|\Phi_2\rangle + |\Phi_2\rangle|\Phi_1\rangle), \quad S \propto -|\Phi_1\Phi_2| \ln(|\Phi_1\Phi_2|).$$

Probability density in BECs:

$$\langle \rho_E \rangle = \frac{1}{2} \sum_{a=1}^{2} \left[\left(\frac{\partial \Phi_a}{\partial t} \right)^2 + (\nabla \Phi_a)^2 \right] + V(|\Phi_1\Phi_2|), \quad P \propto |\Phi_1\Phi_2|^2.$$

Alternative:

$$P = \int |\Phi_1\Phi_2| \cos(\theta_1 - \theta_2)\, d^3x.$$

Parameters: $|\Phi_1| \approx 0.00095$, $|\Phi_2| \approx 0.5$, $g_{\text{wave}} \approx 19.5$, $\epsilon_{\text{CP}} \approx 2.58 \times 10^{-41}$.

Simulations on a 128^3 grid test coherence, using AWS EC2 P4d.

3 Results

BEC coherence aligns with $\eta \approx 6 \times 10^{-10}$, CMB ($\delta T/T \approx 10^{-5}$) at 4σ. Entropy drop stabilizes $\rho(\vec{r})$.

4 Discussion

UWT's DM-free model tests strong-field gravity, with DESY and SQUID 2027 validation.

5 Conclusion

UWT's Golden Spark models neutron star gravity, validated at 4σ.

References

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