Unified Unit System in the T0 Model: The Consistency of $\alpha = 1$ and $\beta = 1$

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Abstract

This work examines the theoretical consistency of setting both the fine-structure constant $\alpha_{EM} = 1$ and the T0 model parameter $\beta_{\mathrm{T}}^{\mathrm{nat}} = 1$ in natural units. Through dimensional analysis and fundamental interactions, it demonstrates their compatibility, linking electromagnetic and T0 dynamics within the time-mass duality framework [1].

Contents

1 Introduction

Simplifying unit systems reveals physical structures, as seen with $c = 1$ in relativity and $\hbar = 1$ in quantum mechanics [2]. The T0 model extends this by setting $\alpha_{EM} = 1$ and $\beta_{\mathrm{T}}^{\mathrm{nat}} = 1$, unifying electromagnetic and T0 interactions [1]. This paper analyzes their consistency.

2 Unified Unit System

2.1 Fine-Structure Constant

The fine-structure constant is:

$$\alpha_{EM} = \frac{e^2}{4\pi\varepsilon_0\hbar c} \approx \frac{1}{137.036}. \tag{1}$$

With $\alpha_{EM} = 1$, $\hbar = c = \varepsilon_0 = 1$:

$$e = \sqrt{4\pi}, \tag{2}$$

making charge dimensionless [2].

2.2 T0 Parameter β_{T}

The T0 parameter β_{T} couples the intrinsic time field $T(x)$ to physical phenomena [4]. It is derived as:

$$\beta_{\mathrm{T}}^{\mathrm{nat}} = \frac{\lambda_h^2 v^2}{16\pi^3 m_h^2 \xi}, \tag{3}$$

with $\xi \approx 1.33 \times 10^{-4}$, yielding $\beta_{\mathrm{T}}^{\mathrm{nat}} = 1$ in natural units [3].

2.3 Dimensional Consistency

Dimensional analysis of β_{T}:

- λ_h: dimensionless.
- v: $[E]$.
- ξ: $[E^{-1}]$.
- m_h: $[E]$.

Thus:

$$\beta_{\mathrm{T}}^{\mathrm{nat}} = [E]^2/[E]^2 \cdot [E^{-1}] = [1], \tag{4}$$

compatible with $\alpha_{EM} = 1$.

3 Implications

The unified system simplifies T0 dynamics, supporting cosmological predictions like redshift [3] and nonlocality [5].

4 Conclusion

Setting $\alpha_{EM} = \beta_{\mathrm{T}}^{\mathrm{nat}} = 1$ unifies interactions in the T0 model. For β_{T} details, see [3]; for T0 theory, see [4].

References

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