T0_deckblatt_En.png

Contents

Chapter 1

Introduction to T0-Theory

The T0-Theory is a new approach to unifying fundamental physics. The central thesis states:

> **Central Theorem**
>
> All natural constants and physical parameters can be derived from a single dimensionless number: the fine-structure constant $\alpha \approx 1/137$.

1.1 Time-Mass Duality

The core principle of T0-Theory is the Time-Mass Duality:

$$T(x) = \frac{\hbar}{E(x)} = \frac{\hbar}{m(x)c^2} \tag{1.1}$$

This relationship shows that time and mass are intrinsically linked.

> **Fundamental Principle**
>
> In regions with higher energy density, intrinsic time runs slower - exactly as General Relativity predicts for gravitation.

1.2 The Scaling Parameter ξ

The dimensionless scaling parameter ξ connects all natural constants:

$$\xi = \frac{4}{3} \times 10^{-4} \approx \sqrt{\alpha} \tag{1.2}$$

Chapter 2

Particle Masses and Fundamental Constants

The masses of all elementary particles can be derived from the scaling parameter ξ and the Planck mass.

2.1 Lepton Masses

The Koide formula finds its natural explanation in the T0 framework:

$$\frac{m_e + m_\mu + m_\tau}{(\sqrt{m_e} + \sqrt{m_\mu} + \sqrt{m_\tau})^2} = \frac{2}{3} \tag{2.1}$$

Chapter 3

Cosmological Implications

3.1 The Hubble Constant

The T0-Theory provides a geometric derivation of the Hubble constant:

$$H_0 \approx \frac{c}{\xi \cdot L_P} \cdot \alpha^2 \qquad (3.1)$$

3.2 Dark Energy

The cosmological constant is explained as a consequence of intrinsic time.

Chapter 4

Experimental Predictions

> **Testable Predictions**
>
> - Anomalous magnetic moment of the electron: $(g-2)_e$
>
> - Koide formula extensions for quarks
>
> - Frequency-independent effects

Appendix: Formula Collection

Here are the key formulas of T0-Theory summarized.