

SI-Einheiten und T0-Theorie

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Kapitel 1

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Zusammenfassung

Die T0-Theorie verwendet natürliche Einheiten ($c = \hbar = 1$), aber die Verbindung zum SI-System ist für experimentelle Vergleiche essentiell. Dieses Dokument zeigt die Umrechnung zwischen T0 und SI-Einheiten.

1.1 Das SI-Einheitensystem

1.1.1 Die sieben Basiseinheiten

Das Internationale Einheitensystem basiert auf:

- Meter (m) – Länge
- Kilogramm (kg) – Masse
- Sekunde (s) – Zeit
- Ampere (A) – Stromstärke
- Kelvin (K) – Temperatur
- Mol (mol) – Stoffmenge
- Candela (cd) – Lichtstärke

1.1.2 Naturkonstanten im SI

Konstante	Symbol	SI-Wert
Lichtgeschwindigkeit	c	299 792 458 m/s
Planck-Konstante	\hbar	$1,055 \times 10^{-34}$ J·s
Gravitationskonstante	G	$6,674 \times 10^{-11}$ m ³ /(kg·s ²)
Feinstrukturkonstante	α	1/137,036

Tabelle 1.1: Fundamentale Naturkonstanten

1.2 Natürliche Einheiten in T0

1.2.1 Das T0-Einheitensystem

In T0 setzen wir:

$$c = \hbar = 1 \quad (1.1)$$

Alle Größen werden in Potenzen der Energie ausgedrückt.

1.2.2 Umrechnungsfaktoren

SI zu T0 Umrechnung

$$1 \text{ m} = \frac{1}{\hbar c} \times 1 \text{ GeV}^{-1} = 5,068 \times 10^{15} \text{ GeV}^{-1} \quad (1.2)$$

$$1 \text{ s} = \frac{1}{\hbar} \times 1 \text{ GeV}^{-1} = 1,519 \times 10^{24} \text{ GeV}^{-1} \quad (1.3)$$

$$1 \text{ kg} = c^2 \times 1 \text{ GeV} = 5,610 \times 10^{26} \text{ GeV} \quad (1.4)$$

1.3 Der ξ -Parameter in SI

Der fundamentale T0-Parameter hat in SI-Einheiten den Wert:

$$\xi = \frac{4}{3} \times 10^{-4} \approx 1,333 \times 10^{-4} \quad (1.5)$$

Dieser Wert ist dimensionslos und damit in allen Einheitensystemen gleich.

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