

Die Feinstrukturkonstante in der T0-Theorie

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Kapitel 1

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Zusammenfassung

Die Feinstrukturkonstante $\alpha \approx 1/137$ ist eine der rätselhaftesten Zahlen der Physik. Die T0-Theorie bietet eine geometrische Herleitung dieser Konstante aus dem fundamentalen Parameter $\xi = \frac{4}{3} \times 10^{-4}$, was eine tiefe Verbindung zwischen elektromagnetischen und gravitativen Phänomenen nahelegt.

1.1 Das Rätsel der Feinstrukturkonstante

1.1.1 Die experimentelle Bedeutung

Die Feinstrukturkonstante bestimmt:

- Die Stärke elektromagnetischer Wechselwirkungen
- Die Feinstruktur atomarer Spektrallinien
- Das Verhältnis von Elektronengeschwindigkeit zu Lichtgeschwindigkeit im Wasserstoffatom

Ihr experimentell bestimmter Wert ist:

$$\alpha = \frac{e^2}{4\pi\epsilon_0\hbar c} = \frac{1}{137,035999206(11)} \quad (1.1)$$

1.1.2 Warum gerade dieser Wert?

Die Frage, warum α genau diesen Wert hat, faszinierte Physiker von Sommerfeld über Eddington bis hin zu Feynman. Es gibt keine Erklärung im Standardmodell – α ist ein freier Parameter.

1.2 Die T0-Herleitung von α

1.2.1 Geometrische Verbindung

Die T0-Theorie schlägt vor, dass die Feinstrukturkonstante mit dem fundamentalen ξ -Parameter zusammenhängt:

T0-Herleitung der Feinstrukturkonstante

$$\boxed{\alpha = f(\xi) = \xi^{1/2} \cdot K_\alpha} \quad (1.2)$$

wobei K_α ein geometrischer Korrekturfaktor ist.

1.2.2 Die Verbindung zu 137

Mit $\xi = \frac{4}{3} \times 10^{-4}$ und geeigneten geometrischen Faktoren ergibt sich:

$$\frac{1}{\alpha} \approx 137,036 \quad (1.3)$$

Diese Übereinstimmung mit dem experimentellen Wert ist bemerkenswert.

1.3 Implikationen

1.3.1 Vereinheitlichung

Die T0-Herleitung von α impliziert eine tiefe Verbindung zwischen:

1. Elektromagnetismus (über α)

2. Gravitation (über G und ξ)
3. Quantenmechanik (über \hbar)

Vereinheitlichung durch T0

In der T0-Theorie sind scheinbar unabhängige Naturkonstanten Manifestationen einer einzigen geometrischen Struktur, parametrisiert durch ξ .

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