Improved Equation Rendering Test

Testing Improved Equation Rendering

This document tests the improved rendering of complex mathematical equations in LaTeX and PDF output.

Einstein Field Equations

The Einstein field equations relate the geometry of spacetime to the distribution of matter within it.

Gμν + Λ gμν = 8π G⁄c■ Tμν

Original LaTeX:

```
G_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}
```

Schrödinger Equation

The Schrödinger equation describes how the quantum state of a physical system changes over time.

i■∂⁄∂ tΨ(r,t) = HΨ(r,t)

Original LaTeX:

```
i\hbar\frac{\partial}{\partial t}\Psi(\mathbf{r},t) = \hat{H}\Psi(\mathbf{r},t)
```

Maxwell's Equations

Maxwell's equations describe how electric and magnetic fields are generated by charges, currents, and changes of each other.

∇ · E &= ρ⁄ε■ \\ ∇ · B &= 0 \\ ∇ × E &= -∂B∂ t \\ ∇ × B &= μ■J + μ■ε■∂E∂ t

Original LaTeX:

```
\begin{align} \nabla \cdot \mathbf{E} &= \frac{\rho}{\epsilon_0} \\ \nabla \cdot
\mathbf{B} &= 0 \\ \nabla \times \mathbf{E} &= -\frac{\partial\mathbf{B}}{\partial t}
\\ \nabla \times \mathbf{B} &= \mu_0\mathbf{J} +
\mu_0\epsilon_0\frac{\partial\mathbf{E}}{\partial t} \end{align}
```

Dirac Equation

The Dirac equation is a relativistic wave equation that describes the behavior of fermions.

(iγ^μ ∂_μ - m)ψ = 0

Original LaTeX:

```
(i\gamma^\mu \partial_\mu - m)\psi = 0
```

Path Integral Formulation

The path integral formulation of quantum mechanics describes the amplitude for a particle to travel from one point to another as a sum over all possible paths.

```
■ q_f, t_f | q■, t■ ■ = ∈tq■■_■■■q_■q■■_■■■q_■ Dq(t)
(i⁄■S[q])
```

Original LaTeX:

```
\langle q_f, t_f | q_i, t_i \rangle = \int_{q(t_i)=q_i}^{q(t_f)=q_f} \mathcal{D}q(t)
\exp\left(\frac{i}{\hbar}S[q]\right)
```