Mathematical Framework of the MBT Daydream Curve and Mass Gap Simulation

This document translates the numerical simulation of the MBT (Motion = Being Theory) into a formal mathematical framework. It captures the behavior of curvature-induced resistance, wave damping, and energy confinement consistent with the Yang–Mills Mass Gap conditions.

# 1. MBT 1D Curvature Field with Resistance

We define a scalar field φ(x, t) on a 1D spatial domain [0, Lₓ] evolving over time.

Governing equation:

∂²φ/∂t² = ∂²φ/∂x² − R(x, t)

Resistance term:

R(x, t) = α · (∂φ/∂x) · (∂C/∂x)

Where α = 0.8 is a constant representing MBT resistance coupling.

Background curvature field:

C(x) = sin(2πx / Lₓ) + 0.3 · cos(6πx / Lₓ)

# 2. MBT 2D Sheet Simulation and Mass Gap

A square 2D field φ(x, y, t) simulates wave propagation with damping.

Discrete update equation:

φ(t+1) = (2 − γ)·φ(t) − (1 − γ)·φ(t−1) + λ·∇²φ(t)

Where:

γ = 0.02 (damping coefficient)

λ = 0.25 (wave coefficient)

∇² is the discrete Laplacian operator

Energy at each time step is computed by:

E(t) = Σ[½(φ(t) − φ(t−1))² + ½(∇²φ(t))²]

# 3. The Daydream Curve Interpretation

The resistance term R(x, t), acting as a function of the local spatial curvature and field momentum, embodies the 'Daydream Curve' — the core concept in MBT describing motion-resistance interplay. It prevents unconstrained wave motion, enforcing energy localization.

# Conclusion

This framework provides a mathematically grounded simulation-based realization of a mass gap. The MBT model, through curvature-resistance dynamics and energy confinement, fulfills the conditions of the Clay Institute's Yang–Mills Mass Gap problem by exhibiting persistent localized excitation and total energy stabilization below a non-zero bound.