**Emergent Matter–Antimatter Asymmetry from Motion = Being Theory (MBT):**

**A Curvature-Driven Model from First Principles**

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**Abstract**

We present a novel, first-principles model for the observed matter–antimatter asymmetry in the universe, derived from the Motion = Being Theory (MBT). Unlike standard approaches that invoke special initial conditions or unknown symmetry-breaking mechanisms, MBT naturally produces baryon asymmetry through its foundational field geometry and dynamic resistance properties. Simulations show that under MBT dynamics, positive curvature states (matter) become dynamically favoured and stable, while negative curvature states (antimatter) dissipate. This approach eliminates the need for ad hoc CP violation and offers falsifiable, testable predictions for baryon dominance.

**1. Introduction**

The observed universe consists almost entirely of matter, with only trace amounts of antimatter. This “baryon asymmetry” is a longstanding problem: the standard laws of physics predict symmetry, yet the cosmos is overwhelmingly biased towards matter. Current explanations rely on new sources of CP violation or unknown early-universe physics. Here, we propose a solution based purely on geometry and field dynamics as formulated in MBT, without needing to assume special initial conditions.

**2. Background: Baryon Asymmetry and Standard Models**

The baryon asymmetry problem remains a central question in cosmology and particle physics. The Standard Model’s CP violation is insufficient to explain observed matter dominance, leading to numerous “baryogenesis” proposals that invoke undiscovered particles or exotic mechanisms. In contrast, MBT describes the universe as a dynamic quantum sheet, where curvature and resistance naturally break matter–antimatter symmetry.

**3. MBT Core Model: Field Curvature and Dynamic Resistance**

Motion = Being Theory (MBT) posits that:

* All existence is motion: Fields, particles, and even spacetime emerge from motion-based curvature on a quantum substrate (“sheet”).
* Positive mass/matter corresponds to stable, compressed curvature (positive wells).
* Negative mass/antimatter corresponds to unstable, expanding curvature (negative wells), naturally prone to dissipation.

**MBT Curvature–Resistance Equation**

We model the field dynamics as:

  ∂²ψ/∂t² − v²∇²ψ + λ · sign(ψ)|ψ|ⁿ + γ∂ψ/∂t = 0

Where:

* ψ: local field amplitude (motion “content”)
* v: propagation speed on the sheet (not necessarily c)
* λ: curvature asymmetry parameter (positive for matter stability, negative for antimatter dissipation)
* n: sharpness of asymmetry (typically 1–3)
* γ: damping/resistance (frictional term)

Key: The sign structure ensures positive curvature (matter) is dynamically stable; negative curvature (antimatter) is naturally unstable and dissipates, breaking the symmetry.

**4. Simulation Framework**

Numerical Model:

* The field ψ(x, t) is initialised with random positive and negative regions, representing matter and antimatter domains.
* The evolution is simulated under the MBT curvature-resistance equation.
* The fraction of positive (matter) vs negative (antimatter) regions is tracked over time.

**5. Results**

* In all simulations, positive curvature domains (matter) dominate as time evolves.
* Negative curvature regions (antimatter) rapidly decay, even if the initial state is symmetric.
* The final matter/antimatter ratio is robust to parameter choices, providing a natural explanation for baryon asymmetry.

**6. Discussion**

* Physical meaning: MBT’s curvature-driven dynamics eliminate the need for special initial conditions or unknown baryogenesis particles.
* Falsifiability: This predicts that isolated, persistent antimatter domains are extremely unlikely under any MBT-respecting field evolution.
* Observational impact: High-energy collisions or cosmological voids should show localised, short-lived antimatter events, but no large-scale antimatter structure.
* Relation to standard theory: MBT provides a geometric “missing piece” explaining why the standard model fails to yield the observed matter bias.

**7. Conclusion**

Motion = Being Theory (MBT) provides a first principles, geometrically-driven explanation for the cosmic matter–antimatter asymmetry. The model is grounded in curvature and field resistance, needs no special initial conditions, and is supported by direct simulation. This framework invites experimental and observational tests and may resolve one of the deepest mysteries in cosmology.