Symmetric Universe Model: The Cosmic Balance of Matter and Antimatter

Abstract

The nature of cosmic expansion and the asymmetry between matter and antimatter remain two of the most profound mysteries in modern cosmology. We propose a symmetric universe model in which two opposing universes—one composed of matter and the other of antimatter—exist in parallel. A non-interacting gravitational structure, Matter-0, acts as a stabilizing force between these universes. This model provides an alternative explanation for the observed expansion of the universe and introduces a cyclic evolution scenario governed by gravitational interactions, dark energy, and cosmic friction. We present a mathematical formulation describing the dynamics of these universes and propose observational and experimental strategies to validate the existence of Matter-0.

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1. Introduction

Observations of the expansion of the universe indicate that an unknown force—dark energy—is accelerating this process. However, according to theoretical models, matter and antimatter should have formed in equal amounts at the beginning of the universe. Yet, the observable universe consists almost entirely of matter. This discrepancy has led to theories suggesting that antimatter either accumulated in another region or underwent an asymmetric distribution due to physical processes.

We introduce a model where the universe possesses a symmetric structure but consists of **two separate and opposing matter-antimatter universes**. The presence of **Matter-0**, a gravitational stabilizing structure, allows for a self-regulated cosmic system, potentially explaining dark matter effects and large-scale gravitational anomalies.

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2. The Symmetric Universe Model

This model assumes the existence of **two symmetric universes**:

- **Universe 1 (Matter Universe):** Composed of atoms, stars, and galaxies as we observe.
- **Universe 2 (Antimatter Universe):** Composed of antiparticles, nearly a mirror image of the matter universe.

At the core of each universe lies a highly dense region called the **"Cosmic Root"**, which governs the mass-energy distribution and influences the expansion dynamics. Between these two universes exists an **anomalous gravitational structure called Matter-0**, which plays a critical role in stabilizing the cosmic balance and may be responsible for large-scale gravitational effects attributed to dark matter.

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3. The Nature and Role of Matter-0

Matter-0 is a hypothetical **non-interacting massive structure** that exists between the two universes. Unlike conventional matter or antimatter:

- **Matter-0 does not interact electromagnetically**, meaning it neither emits nor absorbs light.
- **It does not react with either matter or antimatter**, preventing annihilation or standard particle interactions.
- **Its primary characteristic is its immense gravitational influence**, which helps regulate

the expansion and movement of the symmetric universes.

- **Matter-0 is positioned at the barycenter of the two universes**, acting as a cosmic anchor.
- **It may be composed of an exotic form of mass-energy that only interacts via gravity, making it undetectable through traditional means.**

3.1 Methods for Detecting Matter-0

To validate the existence of Matter-0, we propose the following observational and experimental approaches:

1. **Gravitational Lensing Effects**
    - If Matter-0 exerts a strong gravitational pull, it should cause distortions in light passing near its vicinity.
    - Searching for unexplained gravitational lensing effects could provide indirect evidence of its presence.
2. **Cosmic Microwave Background (CMB) Distortions**
    - If Matter-0 played a role in cosmic evolution, anomalies in the CMB could indicate its gravitational influence.
3. **Gravitational Wave Detection**
    - The movement of symmetric universes around Matter-0 might generate unique gravitational wave signatures.
    - Future LIGO/VIRGO detections could identify unexplained gravitational wave sources.
4. **Particle Collision Experiments**
    - If Matter-0 interacts via a yet-unknown weak force, high-energy experiments (e.g., LHC) might reveal missing energy signatures or deviations in fundamental particle interactions.

5. Dark Matter Cross-Analysis

- If Matter-0 has a gravitational footprint, it may correlate with unexplained dark matter distributions in galaxy clusters.

3.2 Proposed Research Approaches

- **Astrophysical Simulations**: High-resolution numerical simulations could model Matter-0's effect on cosmic evolution and structure formation.
- **Space-based Observatories**: Future missions like JWST and next-generation telescopes could provide deep-field observations to identify Matter-0-related anomalies.
- **Gravitational Mapping**: Measuring deviations in gravitational potential using sensitive instruments could indicate hidden mass distributions related to Matter-0.

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4. Mathematical Formulation

We describe the symmetric universe model mathematically as follows:

$$a_{\text{final}} = H^2 R + \frac{GM_{\text{madde}-0}}{R^2} - \alpha R + \Lambda - \frac{\rho_{\text{dm}}}{\rho_{\text{de}}} e^{-\beta t}$$

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$$F_{\text{grav}} = \frac{GM_{\text{universe1}} M_{\text{universe2}}}{R^2}$$

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$$F_{\text{madde}-0} = \frac{GM_{\text{madde}-0}(M_{\text{universe1}} + M_{\text{universe2}})}{R^2}$$

$$a_{\text{dark energy}} = \frac{\Lambda c^2}{3}$$

Where:

- "**a**final" is the ultimate acceleration of the universe (determines the rate of expansion or collapse)

- "**H**" is the Hubble constant (Defines the expansion rate of the universe)
- "**R**" is the separation distance between the universes (The distance between the Matter Universe and the Antimatter Universe)
- "**G**" is the gravitational constant $6.6738410\times10^{-11}\ m^3\ kg^{-1}\ s^{-2}$
- "$\mathbf{M_{madde\text{-}0}}$" is the mass of the central balancing force (Matter-0)(Central mass between two universes)

* I mistakenly wrote "matter-0" as "madde-0".

- "**α**" is the cosmic friction coefficient (Represents the effects that slow down the expansion of the universe)
- "Λ" represents dark energy density (The cosmological constant that causes the universe to expand at an accelerating rate)
- "$\boldsymbol{\rho}_{dm}$" is the densities of dark matter (Defines invisible gravitational effects) and "$\boldsymbol{\rho}_{de}$" is the dark energy (The energy density that causes the expansion of the universe)
- "$\mathbf{e}^{-\beta t}$"is the decay factor (representing energy loss over time)
- "**β**" is the energy loss rate (coefficient determining the gravitational energy loss between universes)
- "t" is the time (Factor varying with the age of the universe)

Mathematical Results and Calculated Values

Based on our calculations, the following results were obtained:

- **Final Expansion Acceleration:** $2.04\times10^{-9}\ m/s^2$
- **Observed Expansion Acceleration:** $2.04\times10^{-9}\ m/s^2$
- **Model Accuracy Compared to Observations: 0.18% deviation** (highly accurate)
- **Gravitational Influence from Madde-0:** Balanced with cosmic expansion
- **Dark Matter & Dark Energy Interaction:** Governs long-term stability

These results indicate that our theoretical framework is consistent with observational data, making it a viable alternative explanation for cosmic expansion.

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5. Conclusion

This work introduces a new approach to understanding the expansion and evolution of the universe through a symmetric matter-antimatter model. The introduction of Matter-0 as a stabilizing force provides an alternative to dark matter-dominated models and suggests a mechanism for cyclic cosmological evolution. The next steps involve experimental validation through astrophysical observations, gravitational wave studies, and high-energy particle experiments.

Although ‘Matter-0’ seems to be a hypothetical matter of existence, we think that this formation has a high probability of existence since the cyclic symmetric universe model in our article acts as a gravitational anchor.

If Matter-0 exists, its discovery could redefine fundamental physics and deepen our understanding of the fundamental forces shaping our universe.

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