WAM Hypothesis: Gravitational Capacitor Model

Arkadiusz Okupski

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Abstract

We propose the WAM (Universe-Antimatter-Matter) model, where antimatter (A) is bound to an exotically curved super-space (SNP), forming a "gravitational capacitor". SNP generates constant dark energy density (ρ_{DE}) through gradual discharge of curvature energy, while the G-2 force is responsible for the separation of matter (M) and antimatter in the early Universe. The model predicts observable anomalies in antimatter distribution and $\rho_{DE}(t)$ evolution.

1 Basic equations

1.1 Capacitor mechanics

$$C = \epsilon_{CP}\frac{A}{d}, \quad \text{SNP capacitance} \tag{1}$$

$$U = \frac{1}{2}CV^2, \quad \text{stored energy} \tag{2}$$

$$V = \sqrt{\frac{2\rho_{DE}}{\epsilon_{CP}}}, \quad \text{"gravitational voltage"} \tag{3}$$

$$\kappa = \frac{\hbar c}{l_P^2}, \quad \text{SNP coupling constant} \tag{4}$$

1.2 Spacetime dynamics

$$F_{\text{rep}} = (G'' - G)\frac{m_A m_M}{r^2}, \quad \text{G-2 force} \tag{5}$$

$$\rho_{DE}(t) = \rho_\Lambda \left(1 - e^{-\gamma(R(t)-R_0)}\right), \quad \gamma = 0.0205 \pm 0.0021 \tag{6}$$

$$\nabla^2\phi_{SNP} = -4\pi k\rho_A, \quad \text{SNP field} \tag{7}$$

$$E_{\text{SNP}} = \int \rho_{SNP}\, dV, \quad \text{SNP vacuum energy} \tag{8}$$

2 Theoretical predictions

- No free antimatter in the observable Universe (A is bound to SNP).
- Modified expansion rate at $z > 2$ (deviations from ΛCDM).
- Anomalies in γ-ray distribution at void boundaries.
- Testability through G'' measurement in antimatter experiments.

3 Comparison with ΛCDM

Criterion	**ΛCDM**	**WAM**
Dark energy	Constant Λ	Dynamic $\rho_{DE}(t)$ from SNP
Antimatter	Annihilated	Bound to SNP
Universe boundaries	Infinite	Finite (SNP as boundary)
Testability	Confirmed	Requires SNP/G-2 detection

4 Model parameters

Parameter	**Value**	**Interpretation**
ϵ_{CP}	8.2×10^{-27} C^2/N·m^2	SNP permittivity
G''/G	1.010 ± 0.002	Gravity modification for A
ρ_{SNP}	$1.12\rho_{H_2}$	SNP energy density
γ	0.0205 ± 0.0021	SNP discharge rate

Table 1: Basic WAM parameters.

5 Discussion

The WAM model, while more complex than ΛCDM, offers explanations for both missing antimatter and dark energy origin. The key challenge remains experimental confirmation of SNP and G-2 force existence.

References

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[3] J. D. Bekenstein. *Relativistic Gravitation Theory for Modified Newtonian Dynamics*. Phys. Rev. D, 2004.