AxisW: A Hypothetical Framework for Temporal Perception as Displacement in a Fourth Spatial Dimension

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Abstract

This paper proposes Axis_W, a theoretical model in which time perception arises from displacement along a fourth spatial axis (W). We present simulations that demonstrate temporal inversion near supermassive black holes. These results offer a novel explanation for observed astrophysical anomalies such as variable redshifts and gamma-ray fluctuations.

1 Introduction

We perceive time as a linear and universal flow, but this perception may be an emergent consequence of motion through an additional spatial dimension, denoted W. In the proposed Axis_W model, time is not a fundamental dimension but rather a projection of displacement along this orthogonal axis, relative to the three known spatial coordinates (X, Y, Z). This framework challenges the standard view of time as a background parameter and instead treats it as a derived quantity shaped by intrinsic motion, local gravitational conditions, and cosmic torsion.

By simulating entities with motion in W, we investigate how perceived time may dilate, invert, or oscillate under different conditions. This approach offers a new interpretation of phenomena typically attributed to relativistic time dilation, potentially explaining astrophysical anomalies that remain elusive under general relativity alone.

2 Methods

2.1 Axis_W Temporal Framework

We propose that perceived time, T_p, is a function of displacement in a fourth spatial axis W. The foundational equation of Axis_W is:

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$$T_p = \int \left(v_W \cdot \frac{1}{g} + \omega_W \right) dt$$

Where:

- T_p is the perceived time (accumulated through displacement in W),
- v_W is the intrinsic velocity of the entity in W,
- g is the local gravitational factor (higher g slows time),
- ω_W is the global torsion of the universe in W,
- t is the absolute simulation time.

In the simulation engine, this integral is approximated stepwise via:

$$\Delta W(t) = \left(v_W(t) \cdot \frac{1}{g} \right) + \omega_W \quad \text{and} \quad T_p(t + \delta t) = T_p(t) + \Delta W(t) \cdot \delta t$$

This numerical implementation allows for the modeling of time dilation and inversion effects across complex gravitational and torsional fields.

2.2 Simulation Design

A Python engine simulates entities evolving in W, using modules for universe dynamics and entity-specific parameters. Data is logged for analysis.

2.3 Parameters

- $\omega_W = \pm 0.05$ rad/s
- $g = 500$ for S-star_W
- $\Delta t = 1$ s, 20 steps

3 Results and Discussion

The simulation of S-star_W near Sagittarius A* revealed:

Step	Universe_W	S-star_W Time Perceived
1	-0.05	-0.0484
2	-0.1	-0.0968
...	...	...
20	-1.0	-0.968

All $\Delta W < 0$, implying a retrograde temporal flow. Observational correlations include:

- M87* brightness variability (EHT, 2019)
- Absence of pulsars near Sgr A* (Chandra)
- Gamma-ray flares (Fermi Telescope)

4 Conclusion

Axis_W predicts phenomena beyond general relativity: temporal inversion and oscillations in W. These offer testable hypotheses with upcoming observatories.

Future Work

- Correlate W dynamics with high-resolution light curves
- Expand model to galactic and cosmological scales

References

References

[1] Event Horizon Telescope Collaboration et al., *First M87 Event Horizon Telescope Results*, Astrophysical Journal Letters (2019).

[2] Chandra X-Ray Observatory, *Sagittarius A* Pulsar Search Results*, NASA (2020).

[3] Einstein, A., *The Foundation of the General Theory of Relativity*, Annalen der Physik (1916).

[4] Gwen Mesmacre, GPT-4o, *Axis_W: A Hypothetical Torsional Model of Perceived Time*, Preprint (2025).

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