ChatGPT

Title: SHiFT Theory – Surface Helix-induced Field Transition

Abstract
We propose a new theoretical framework, SHiFT (Surface Helix-induced Field Transition), which interprets dark matter not as an independent substance or particle, but as a transitional gravitational phase of baryonic matter. This phase would emerge from topological stress and helical torsions in the spacetime lattice, particularly near massive rotating objects such as black holes. Under certain conditions, baryonic matter could lose electromagnetic coherence and enter a metastable, purely gravitational phase, manifesting as dark matter. Such a transition would also involve an inversion in the perceived polarity of gravitational mass: the shifted matter would behave as a curving field with opposite polarity, generating spatial curvature that is concave relative to that produced by ordinary matter.

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1. Introduction
The nature of dark matter remains one of the most open problems in cosmology. While prevailing models postulate the existence of a separate non-baryonic component (e.g., WIMPs or axions), none have been directly observed. In contrast, the SHiFT Theory proposes that dark matter is the result of a gravitational phase transition undergone by ordinary matter under extreme spacetime deformation. Inspired by analogies from fluid dynamics and digital information theory (bit shift operations), the theory explores the consequences of matter transitioning through a "gravitational surface tension."

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2. Physical Model
SHiFT hypothesizes the existence of a phase interface in the spacetime lattice. When matter spirals within intense helical gravitational vortices (as around rotating black holes), it may be drawn into a metastable gravitational stratum beneath the observable layer of spacetime. Like bubbles in a carbonated fluid stirred into a vortex, this matter remains gravitationally active but ceases to interact electromagnetically.

2.1 Surface Analogy
The transition is modeled as a surface slip, where baryonic particles lose their "buoyancy" within the electromagnetic sector and fall below a critical threshold. In this analogy, surface tension corresponds to the resistance of spacetime topology to absorb additional torsion without triggering a phase shift. The resulting mass, once shifted, acquires an opposite gravitational polarity, behaving as a distributed negative mass without direct repulsive effects: its influence is purely geometric and structural.

2.2 Resulting Gravitational Signature
Once shifted, matter retains curvature-contributing mass and influences galactic dynamics, though it is no longer detectable via traditional observational methods. This explains the spatial offset between dark and luminous matter and the apparent absence of dark matter in ultra-diffuse galaxies, where the transition mechanism may be less efficient. The variation in gravitational polarity could also induce differential effects on the propagation of gravitational waves, opening the door to future indirect observational tests.

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3. Cosmological Implications

- **Non-coincident distributions**: Explains dark matter halos displaced from galactic centers.
- **Ultra-diffuse galaxies**: Reduced phase shift due to lower central mass density.
- **Post-merger dynamics**: Dark matter persists as a residual structure after baryonic disruption.
- **Longevity**: Dark matter, being decoupled from electromagnetic interactions, persists longer than its luminous progenitor structures.

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4. Hypotheses and Predictive Directions

- Shifted matter should correlate with regions of high torsional spacetime stress.
- In gravitational lensing studies, anomalous halo geometries could be predicted by vortex simulations.
- Atomic-scale simulations may reveal conditions for partial decoherence of baryonic structure.
- Oscillations or delays in gravitational signals near massive structures might suggest the presence of inverted gravitational polarities.

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5. Limitations and Open Questions

- Absence of a direct experimental mechanism.
- Requires integration with quantum gravity models or spacetime lattice formulations.
- The equations of phase interface are speculative and require formalization.
- The concept of gravitational polarity lacks a shared theoretical foundation and demands advanced modeling.

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6. Conclusion

The SHiFT Theory offers an alternative vision of dark matter as a shifted phase state of baryonic matter, induced by gravitational helicity and spacetime topology. While speculative, it presents a coherent narrative that explains numerous anomalous observations within a unified geometric paradigm. The introduction of mass polarity adds a novel descriptive variable for the structural behavior of dark matter.

References

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