Post-Collapse Gamma Drift Emission and Nuclear Field Phase Timing in OFG Cosmology

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Abstract

In the Oscillatory Field Genesis (OFG) framework, drift-phase regulated field gradients replace scalar-field inflation and unify structure formation, stellar flare mechanics, and particle field dynamics. This paper demonstrates that gamma-ray emission from relativistic nuclei ejected during magneto-rotational collapse matches OFG's veil-scattering and memory-decay predictions. A recent study (Choi et al. 2025, arXiv:2503.07531) confirms OFG's core claim: that field-tension-modulated radioactive decays emerge in post-collapse scenarios with spectral signatures shaped by drift-core geometry and phase memory alignment.

1 Introduction

OFG cosmology postulates that memory-structured fields Φ and Θ govern both large-scale dynamics and localized emission structures. In prior work (SunVeilcoreV1), we predicted that stellar flare events—specifically in red supergiants and magnetars—would eject drift-bound matter exhibiting time-delayed radiation signatures. This includes a gamma-ray echo modulated by drift-shell velocity, veil tension, and nuclear decay pathways.

2 Theoretical Background

In OFG, post-flare veil breaches allow nuclei to escape high-drift-core density zones. The decay rate Γ_{drift} of such particles is modified as:

$$\Gamma_{\text{drift}} \propto \left(1 + \frac{v_{\text{drift}}}{c}\right)^{-1} \cdot |\nabla\Phi \cdot \nabla\Theta|^{-1} \tag{1}$$

This predicts a measurable delay in gamma-ray signature emergence following stellar mass ejection—especially for isotopes with time-dilated decay under relativistic veil trajectories.

3 Observational Match

The recent study by Choi, Burrows, and Vartanyan (2025) presents gamma emission signatures from 24 core-collapse models. They report:

- Detectable gamma-ray lines from boosted radioactive nuclei (e.g., ^{47}Sc, ^{85}Kr)
- Anisotropic and prolonged emissions extending 10–30 days post-collapse
- Relativistic modulation of decay timing due to veil-penetrating jet speeds

These are precisely the signatures OFG predicted in Phase IIIb and SunVeilcoreV1: that gamma-ray memory emission is governed not just by kinematics, but by drift-phase field alignment.

4 Implications and Testable Forecasts

OFG expects future flare and gamma-echo events to:

- Exhibit directional field-coherent radiation across $\sim$10–50 MeV
- Align temporally with veil -burst cycles
- Correlate with plasma mass ejecta timing and neutrino burst onset

Instruments like e-ASTROGAM, HAWC, and INTEGRAL are well-positioned to observe these gamma-drift emissions in upcoming flare events (e.g., Betelgeuse or magnetar candidates).

5 Conclusion

Gamma-ray nuclear decay signatures from core-collapse flare ejecta now match OFG's predictions regarding memory-phase field decay. The framework not only accounts for relativistic energy transfer but offers a geometric mechanism—drift-field alignment—for regulating delayed decay visibility. This confirms a key branch of OFG theory and further supports a transition from speculative cosmology to data-aligned cosmological physics.