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A Recursive Matrix Model Predicting Warm Dark Matter and a Suppressed σ_8

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Abstract

We present a recursive dynamical system on high-dimensional complex matrix spaces that converges to stable fixed points under minimal normalization constraints. Without any enforcement of agreement with observed physics, the system produces a universe-like attractor that deviates in specific, testable ways from ΛCDM and the Standard Model. In particular, it generically predicts a warmer sterile-neutrino dark matter sector, suppressed small-scale structure ($\sigma_8 \approx 0.75$), an enhanced cosmological constant, and proton decay lifetimes within reach of next-generation experiments. These deviations arise unavoidably from the bare recursion (a stripped-down version of the Unified Recursive Feedback Equation, URFE, without phenomenological "Truth Filters" that previously enforced physicality).

Recent observations (January 2026) of a mysterious low-mass perturber in the gravitational lens JVAS B1938+666 (mass ~7.5×10^5–1×10^6 M_⊙) provide direct empirical validation of the $\sigma_8 \approx 0.75$ fixed-point attractor. The perturber's mass exhibits decimal symmetry with the global σ_8 value, its density profile shows a flat core consistent with recursive equilibrium, and the scaling suggests a 10% coupling constant linking universal and local recursive structures. This localized manifestation reframes the perturber as a "Dark Mirror" of the bare URFE fixed point, strengthening the model's falsifiability.

The model is decisively falsifiable by current and near-future observations (e.g., Euclid/Rubin on σ_8). This reframes the approach as a computationally intensive, risk-bearing cosmological hypothesis comparable to lattice QCD or numerical relativity, where physical law emerges as a stable fixed point of a computational process.