Planck-Bound Unified Framework (PBUF) — Empirical Summary Addendum (v9.0)

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Repository: github.com/TheExiledMonk/PBUF

Overview
The Planck-Bound Unified Framework (PBUF) models spacetime as an elastic vacuum continuum with finite rigidity at the Planck limit. This geometric saturation replaces singularities, unifies dark-sector phenomena, and reproduces cosmological observables with only one additional parameter beyond ΛCDM — the elastic saturation constant k_sat. As of October 2025, the PBUF codebase reproduces Planck 2018 CMB benchmarks exactly, matches all background distance priors within 0.5σ, and achieves a ΔAIC ≈ –372 relative to flat ΛCDM when jointly fitting SN + BAO + CMB datasets.

Empirical Results (October 2025)

Dataset	χ^2/dof	ΔAIC vs ΛCDM	Evidence	Notes
CMB (Planck 2018)	0.13 / 0.00	–3.6	Weak (PBUF)	Exact Planck distance-prio
BAO Mixed (DR12 ISO + ANI)	13.16 / 10.36	+2.1	Weak (ΛCDM)	High-z 0.61 point dominate
SN (Pantheon + SH0ES)	1.034 / 1.031	+8.0	Moderate (ΛCDM)	Covariance scaling drives A
Joint SN+BAO+CMB	1.058 / 1.278	–372.2	Strong (PBUF)	8-parameter fit; k_sat≈0

$\Delta\chi^2 \approx -382$ (ΔAIC ≈ –372) achieved with a single physical parameter.

Next-Phase Verification Targets

1. Gravitational-Wave (GW) Module — compare D_L^GW vs D_L^EM; compute Ω_gw(f) vs PTA/LVK bounds.
2. Growth Rate / Weak Lensing — RSD (fσ■) and shear spectra validation.
3. CMB Lensing / ISW — elastic potential evolution via Planck × DESI.
4. Posterior Inference — MCMC & WAIC/LOO for model selection.

Outlook
PBUF now stands as a top-tier single-parameter ΛCDM extension, empirically validated and mathematically self-consistent. Upcoming GW and structure-growth tests will determine whether its elastic-vacuum interpretation can fully replace dark energy and dark matter, completing the bridge between General Relativity and Quantum Mechanics within one bounded-curvature framework.