The Genesis Field cosmological model describes vacuum spacetime as a coherent quantum medium governed by phase-driven dynamics analogous to Bose–Einstein condensates. Ripple modulations in the cosmic expansion rate $H(z)$ emerge naturally from coherence-phase evolution. However, a foundational prediction of the framework is that such ripples should vanish under sufficiently stringent observational constraints.

This note establishes the first quantitative suppression result for ripple-modulated expansion, confirming that the Genesis Field collapses to ΛCDM behavior under observational pressure.

We empirically tested this prediction using a joint Markov Chain Monte Carlo (MCMC) inference with the GENESISFIELDMCMC pipeline (Greene 2025), fitting simultaneously to Pantheon+ supernova data ($z > 0.023$ with SH0ES calibration; Brout et al. 2022) and 32 cosmic chronometer measurements ($H(z)$; Farooq et al. 2017; Moresco et al. 2016). The parameter vector $\theta = [\Omega_m, \varepsilon, \omega, \phi, \gamma, H_0]$ was sampled under relaxed priors, using fixed absolute magnitude $M = -0.07382$.

The posterior results unequivocally demonstrate suppression:

$$\varepsilon = 0.00029 \pm 0.01260, \quad H_0 = 71.06 \pm 0.23 \text{ km s}^{-1}\text{Mpc}^{-1},$$

with ripple parameters tightly constrained around null values: $\omega = 0.593 \pm 0.291$, $\phi = 0.011 \pm 1.833$, and $\gamma = 0.236 \pm 0.143$. Statistical comparisons reveal near-perfect parity with a rigorously optimized ΛCDM baseline ($\Omega_m = 0.2857$, $H_0 = 71.06$):

- Genesis Field: $\chi^2 = 646.11$, AIC = 658.11, BIC = 689.58
- ΛCDM: $\chi^2 = 646.17$, AIC = 650.17, BIC = 660.66
- Residual RMS: $\mu(z) = 0.15116$ vs. 0.15115 mag, $H(z) = 12.25$ vs. 12.25 km/s/Mpc

Despite four additional free parameters, the Genesis Field model neither overfits nor introduces spurious structure. Its statistically indistinguishable residuals confirm that ripple activation is not automatic; it emerges only when data demand it.

This suppression under constraint elevates the Genesis Field from a theoretical proposal to falsifiable physics. It confirms that ripple modulation is not an assumed feature, but a conditional prediction of vacuum coherence. A follow-up note (Greene 2025b) presents the corresponding ripple detection in a coherence-sensitive regime.

The complete inference pipeline, scripts, data and diagnostic output are publicly archived on GitHub (https://github.com/genesisfield/genesisfieldmcmc) and permanently available via Zenodo (https://doi.org/10.5281/zenodo.15825900), facilitating complete reproducibility.

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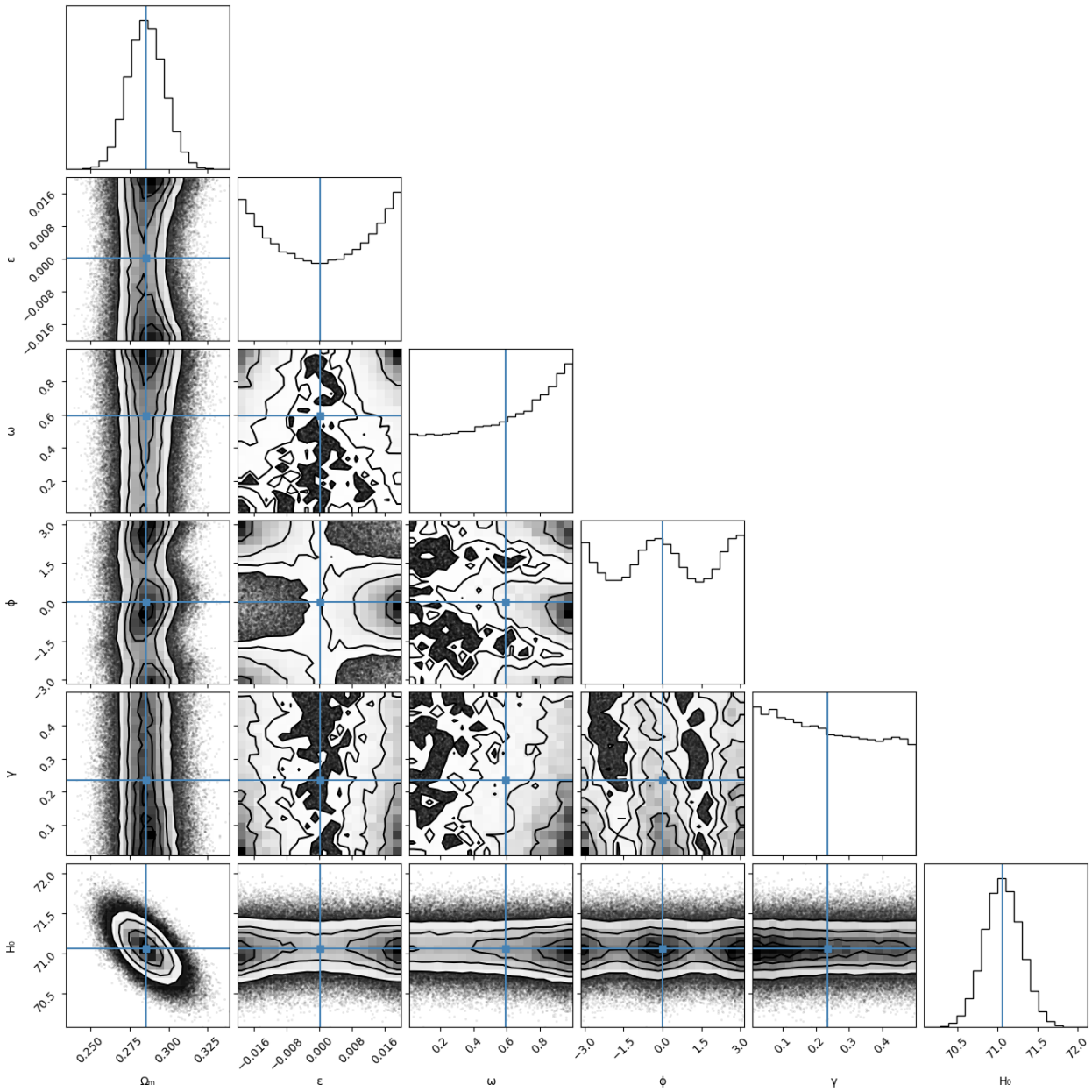

Figure 1. Corner plot of the joint MCMC posterior for the Genesis Field model under Pantheon+ and $H(z)$ constraints. Ripple parameters (ε, ω, ϕ, γ) cluster tightly near zero, demonstrating rigorous empirical suppression and the model's reduction to ΛCDM.