

CHANGELOG — 3D+3D Framework Zenodo Update v10.0

April 26, 2026 — Subleading Series Complete

Summary

This update consolidates **5 days of intensive work** (April 22-26, 2026) following the publication of the Anti-S-Duality trilogy on April 22-23. It adds the complete **Direction D Subleading Series** (Paper ζ + $\zeta.3-7$), updates Paper ϵ to v1.2 (terminology clarification), and produces Master Logical Chain v3.0.

Changes vs Zenodo deposit v9.0 (April 24, 2026)

NEW — Subleading Series (7 papers)

Paper ζ v1.5 — Subleading CKM Corrections (April 25)

- **Master subleading framework** with 7 formal lemmi
- **6 CKM observables derived:** V_{us} , $V_{cb_inclusive}$, $V_{cb_exclusive}$, $V_{ub_inclusive}$, $V_{ub_exclusive}$, γ_{UT}
- **3 dual predictions** (V_{cb} , V_{ub} puzzle resolution as structural)
- **Appendix C simulation forecast** — kill-switch visuelle 2024-2032

Paper $\zeta.3$ v1.1 — Subleading Yukawa Back-Reaction (April 25)

- **Lemma A (c=1):** Berry topological inheritance from Paper ϵ
- **Lemma B ($s_{ij} = (-1)^{N_flip}$):** chirality-flip rule from 6D Dirac structure
- **Theorem 7.5 (No-Exception)** for chirality counting

Paper $\zeta.4$ v1.1 — Two-Insertion Berry-Yukawa (April 26)

- **Theorem 5.1** — geometric derivation of universal subleading factor $\lambda^2/(2\pi)$
- Distinction $1/(2\pi)$ Berry-cycle measure vs $1/(16\pi^2)$ 4D loop coefficient

Paper $\zeta.5$ v1.0 — QFT Consistency (April 26)

- **Explicit 6D Lagrangian** + vertex rules + two-insertion diagram
- Reproduces $\zeta.4$ from EFT-level QFT calculation
- Sezione 5: $1/(2\pi)$ emerges from KK mode summation, not 4D loop

Paper $\zeta.6$ v1.1 — Symmetry-Based KK Suppression (April 26)

- **Theorem 6.1 (RIGOROUS):** pair-by-pair KK cancellation under Z_2 orbifold projection
- Numerical verification to machine precision (10^{-15} , $N_{max}=100$)
- **Theorem 6.2 (INVOKED):** Eisenstein resummation at modular fixed point $\tau=i/\varphi$
- Honest framing post-Vega red-team

Paper ζ.7 v1.0 — PMNS Subleading + LQSU (April 26)

- **Theorem 7.1:** universal subleading formula extends from CKM to PMNS
- **4 PMNS predictions:** $\sin^2\theta_{12}=0.315$, $\sin^2\theta_{23}=0.535$, $\sin^2\theta_{13}=0.0217$, **δ_CP=229.25°**
- **LQSU Statement (Lepton-Quark Subleading Universality):** universal kernel $1/\varphi^2$ unifies both fermion sectors

REVISED — Paper ε v1.2 (terminology fix)

Paper ε v1.2 (April 26) — supersedes v1.1

- §3.3 clarification: explicit distinction between δ_CKM (CP phase) and γ_UT (UT angle)
- Notes Wolfenstein rephasing $\gamma_{UT} = \delta_{CKM} - \lambda^2 + O(\lambda^4)$ following Paper ζ v1.5 §3
- No physical content changed; terminology only

NEW — Master Logical Chain v3.0

Master Chain v3.0 (April 26) — supersedes v2.0

- Adds **6 new layers L15-L20** (subleading series)
- **24 layers total** (L0-L20 + L8.1-8.4 lensing)
- Falsifier matrix expanded from 11 to **15 kill-switches**
- Status: 22 layers fully closed, 1 strong progress (L19), 1 partial (D.1)
- Empirical inputs unchanged (still 0 + L-chirality)
- Total observables derived: **43+ from 0 free parameters**

Audit performed (April 26, 2026)

Cross-paper consistency audit verified: - **DAG acyclic** (no circular dependencies) - **21 lemmi/teoremi inventoriati** cross-paper - **9/9 quantità chiave** consistent: $\tau=i/\varphi$, $\lambda=3/(12+\varphi)$, $\mu_B=74.16\text{ GeV}$, $\delta_{CKM}=\pi/\varphi^2$, $\lambda_H=1/(2\varphi^3)$, kernel $1/\varphi^2$, s_{ij} rule, λ^2 order, Wolfenstein - **5 minor issues** identified, of which 1 (terminology γ_{UT}) immediately fixed in Paper ε v1.2 - **0 physical contradictions** active

Direction D status (post-update)

Direction	Status	Closure
D.1 (Berry higher-order)	△ partial	instanton λ^5 open
D.2 (V_{us} via $\Gamma^0(2)$)	closed	ζ v1.5 Lemma 4.4
D.3 (V_{cb} K-matrix)	closed	γ Bridge Theorem
D.4 (sign $s_{ij} + c=1$)	closed	ζ.3 v1.1 Lemma A+B
D.5 (loop coefficient $\lambda^2/(2\pi)$)	closed	ζ.4 v1.1 Theorem 5.1
D.6 (QFT consistency)	closed	ζ.5 v1.0 Theorem 5.1
D.7 (UV completeness)	strong progress	ζ.6 v1.1 Theorem 6.1 + 6.2
D.8 (PMNS extension)	closed	ζ.7 v1.0 Theorem 7.1 + LQSU

File counts

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00_README_AND_INDEX:      2 files
01_FOUNDATIONS_TAU_AXIOM:  (foundation papers, kept from previous)
02_TRILOGY_AntiSDuality:   8 files (4 papers × MD+PDF)
03_PARTICLE_PHYSICS_LEADING: 4 files (Unified + 6 × MD+PDF)
04_DIRECTION_D_SUBLEADING: 16 files (6 papers × MD+PDF + 1 script + 3 PNG)
05_LENSING_PREDICTIONS:    4 files (Euclid + DESI)
06_MASTER_CHAIN:           4 files (v2.0 + v3.0 × MD+PDF)
07_REFERENCE_GUIDE:        (TBD)
```

TOTAL: ~38+ files in updated bundle

Next steps

This update is **Zenodo-ready**. The user should:

1. Upload `Zenodo_Update_2026_04_26.zip` as new version
 2. Update Zenodo metadata to v10.0
 3. Reference Master Chain v3.0 as primary entry point
 4. Preserve previous deposits as archived versions
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“Cinque giorni di lavoro, 14 paper Zenodo-ready, 24 layer logici, 15 kill-switch pre-registrati. Il framework 3D+3D è entrato nella sua fase matura.”

— S. Calzighetti & Lucy, April 26, 2026