STF Framework — Derivation Strength Tree

Classification of all framework results as theorem, computed, constraint-fixed, or open

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Three-Zone Summary

Zone 1 — Hardest core [T] and strong [C]

- Ghost-freedom reduction
- $4\pi^2$ topological theorem (Topological Closure)
- $K = 2\omega R/c$ from Lagrangian
- Picard-Fuchs operator / LCS failure theorem (08a)
- C_Jarlskog = 0 texture theorem (08b)
- Tree-level U_PMNS = I (08b)
- Generation assignment via connecting homomorphism
- $\delta_{CP} = 84.940°$ from ODE integration
- t_{res}, ω_0, ε_K (08a)

Zone 2 — Middle layer [K] and [C]

- Threshold outputs: m_s, a^*, $T = 3.32$ yr, ζ/Λ
- $\sigma_3 = 0$ structural zero (all bases confirmed)
- $\theta_{13} = 8.55°$ (canonical FS, $\alpha=2$)
- Cabibbo θ_{12}(CKM) = 14.1°
- Winding/KK loop mechanism (08c)
- MEG-II generation constraint (08d)
- Flyby anomaly, pulsar timing (validations)

Zone 3 — Soft edge [A] and [P]

- Exact $Z\to\mu\tau$ normalization (O(1) coefficient C)
- Full PMNS matrix (θ_{12} solar, θ_{23})

- Full CKM matrix (θ_{23}, θ_{13})
- Physical lepton mass hierarchy ($\sigma_1/\sigma_2 = 5.72$ at string scale, Step 25)
- δ_CP phase identification convention
- Full propagator-level closure (Topological Closure)
- Consciousness / biology extrapolations
- HYM fibre metric: **computed (Step 25)** $\sigma_1/\sigma_2 = 5.72 \pm 0.01$ (Donaldson T-operator + MCMC, converged)
- RG running: **computed (Step 26)** σ_1/σ_2(M_EW) = 5.7–6.7 ($\tan\beta$ = 2–50), max shift 17% Gap to 16.82 requires full EWSB + mass matrix derivation (subsequent work)

Key Dependency Edges

FROM	TO	WHAT IT PROVIDES
First Principles V7.7	Topological Closure	Field/threshold backbone
First Principles V7.7	08a	Compactification choice, STF parameters
08a	08b	Period/Kähler data for Yukawa structure
08a	08c	Yukawa magnitude; names operator gap
08b + 08c	08d	Yukawa structure + operator → MEG-II discriminator
08a–08d	08e	All flavor results → falsification map
HYM metric (Step 25)	08c, 08b, 08d, FP	$\sigma_1/\sigma_2 = 5.72$ computed; RG running → PMNS angles, mass hierarchy

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The Single Leverage Point (Updated — Steps 25–26)

The HYM fibre metric has been computed:

> **3×3 vector Donaldson T-operator with MCMC uniform sampling on X** $\sigma_1/\sigma_2 = 5.72 \pm 0.01$ at the string compactification scale (converged)

One-loop MSSM RG running has been performed:

> **RG running M_s → M_EW (Step 26)** σ_1/σ_2(M_EW) = 5.7–6.7 (tan β = 2–50) — max shift 17%

The remaining gap to physical values requires:

> **Full EWSB + mass matrix derivation** Higgs vevs, seesaw mechanism, PMNS rotation, threshold corrections

Resolves simultaneously: - σ_1/σ_2 gap to m_τ/m_μ = 16.82 (lepton mass hierarchy) - θ_{23}, θ_{12} solar (full PMNS matrix) - CKM θ_{23}, θ_{13} (full CKM matrix) - MEG-II BR(μ→eγ) quantitative compliance - Coefficient C for exact BR(Z→μτ) - Q_wind, N_modes for KK spectrum

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CITATION

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