TFPT Prediction: Exact Electromagnetic Closure and the Fine-Structure Constant

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Standalone prediction note – April 27, 2026

Abstract

This note isolates the TFPT prediction for the Thomson-limit fine-structure constant. The row is not a fit: it is the positive root of the carrier-form electromagnetic closure equation with the exact seam generating function.

Prediction scope and audit

Target. $\alpha^{-1}(0) = 137.0359992168407\ldots$
Status. Physical observable; exact electromagnetic closure on the minimal seam mode.
Dependency class. electromagnetic closure C_{em}
Kill or pressure test. failure of the self-consistent root equation or a stable precision mismatch outside the stated interface uncertainty.

1 Standalone Minimal Kernel

Minimal TFPT kernel used in this prediction

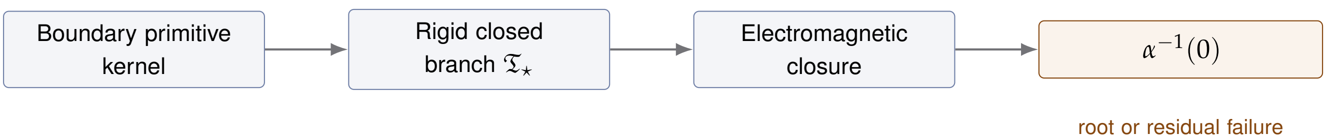
The standalone input package is the boundary-polarized closed branch

$$\mathfrak{S}_{\mathrm{min}} \Rightarrow \mathcal{B}_{\mathrm{min}} \Rightarrow \mathfrak{T}_{\partial}^{\mathrm{min}} \Rightarrow (\tau_{\mathrm{dbl}}, \iota_{C}, P_{\mathrm{prim}}, [u_{\Sigma}], c_3) \Rightarrow d^{\star}_{\mathrm{disc}} \Rightarrow P_{\mathrm{adm}} \Rightarrow \mathfrak{T}_{\star}.$$

The prediction uses only the sector map named in its audit box. Numerical comparison conventions are not theorem inputs; they enter only at the final interface row.

The paper is intentionally one-row: it does not reprove the full TFPT series. It states the minimal closed-branch input needed for this prediction, shows the sector map, and gives the direct failure mode. The source status follows the TFPT 4.5 split: boundary and carrier inputs are core, electromagnetic/flavor/metrology inputs are bridge readouts, QFT closure is conditional, and cosmology rows are downstream comparison targets when explicitly marked.

2 Dependency Graph



Carrier budget and exact seam opening enter before the root is evaluated.

3 Derivation

The electromagnetic row uses the exact seam opening, not the frozen retained seed. With

$$c_3 = \frac{1}{8\pi}, \qquad b_1 = \frac{41}{10}, \qquad \sum_{f,j} L_{f,j}^{\text{diag}} + N_\Phi = 41,$$

define

$$\varphi_\Sigma(\alpha) = \frac{1}{6\pi} + \frac{3e^{-2\alpha}}{256\pi^4}\left(1 - \frac{3e^{-2\alpha}}{256\pi^4}\right)^{-5/4}.$$

The closure function is

$$F_{U(1)}(\alpha) = \alpha^3 - 2c_3^3\alpha^2 - \frac{4}{5}c_3^6\left(\sum_{f,j} L_{f,j}^{\text{diag}} + N_\Phi\right)\log(\varphi_\Sigma(\alpha)^{-1}).$$

The prediction is the unique positive root

$$F_{U(1)}(\alpha_\star) = 0, \qquad \alpha_\star = 0.007297352562209853\ldots, \qquad \alpha_\star^{-1} = 137.0359992168407\ldots.$$

4 No-Knobs and Failure Surface

No-knobs audit

The exact opening $\varphi_\Sigma(\alpha)$ must remain inside the root equation. Freezing it at φ_0^{ret} shifts the result by about 5.02×10^{-4} in α^{-1} and is not the benchmark definition.

5 Minimal Submission Claim

The standalone claim is limited to the displayed target and dependency class. It does not assert that every comparison row of the full TFPT ledger has the same proof status. Any update of the upstream boundary kernel, carrier theorem, or sector map must be propagated into this prediction before the numerical row is distributed.

References

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