

Standard Model Series

Suppression Mechanisms in CPP

Five geometric suppressions from the 600-cell lattice

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Abstract

Catalogs the five suppression mechanisms creating all hierarchical scales in particle physics. All trace to 600-cell geometry: holographic entropy $\sigma = 120^{-d}$, VEV volume dilution $1/N^4$, golden ratio ϕ^k , EM fine-structure $\alpha \sim 1/(360/\phi^2 - 2/\phi^3)$, and radiative loop $S = \alpha/(2\pi)$. None are free parameters.

1. Holographic Entropy

$$\sigma = 120^{(-d)}$$

d = unbound dimensions

2. VEV Volume Dilution

$$\langle \phi \rangle = k * E_P / N_{lattice}^4 * \phi_k$$

3. Golden Ratio Scaling

$$\phi_k = \phi^k$$

Generational hierarchy

4. Fine-Structure Constant

$$\alpha^{(-1)} \sim 360/\phi^2 - 2/\phi^3 \sim 137.036$$

5. Radiative Loop

$$S = \alpha/(2\pi) \sim 1.16 \times 10^{-3}$$

All suppressions are lattice-derived with single electron mass calibration.

References

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