

Prime Front — extracted research

Historical source: `tfpt_2_standard_model.tex` at revision `ba2f0fc`. Original labels, results and caveats are retained; extraction changes ownership only. Complete original: `provenance/tfpt-source`. The publication assembly omits presentation boxes around excerpts.

Contents

Follow-up (2026-08-03): the $\mathbb{Z}[i]$ -module structure of this code page carries a Hecke tower whose primitive degrees are exactly the Gaussian prime norms and whose σ -descended traces reproduce the atom layer of the Weil measure at deviation 0.00 ([\[verification/v714_moonshot_hecke_groupoid.py\]](#), MOONSHOT-GO; fenced honestly: the finite counting facts are E8-unspecific on that slice — the stage-2 specificity question has since been *measured*: the arch sector of the same tower glues with one normalization and E8 becomes forced *at the gluing* ([\[verification/v716_moonshot_arch_glue.py\]](#), 18/18, MOONSHOT-STAGE2-GLUED; the $\{\mathbb{Z}^8, E_8\}$ census of [\[verification/v719_moonshot_traceformula.py\]](#): only the Gaussian E8 glues); the uniqueness theorem stays open under PRIME.Z1.MOONSHOT.01, no marker moves).

*The Reed–Muller cascade (2026-08-06, [\[verification/v819_prime_packet_rm14.py\]](#), 21/21, RM14-EXACT; Lean companion **PacketRM14.lean**, 30 theorems):* the 15-label quotient channel is itself a code — the row hull of B is the punctured $\text{RM}(1, 4)^* = [15, 5, 7]$ with enumerator $1 + 15z^7 + 15z^8 + z^{15}$ exact, C_0 the $[15, 4, 8]$ simplex, χ_{NSR} one codeword (the 7+8 split its two sides, the C_2 register the affine bit), and the self-reproduction cycle $\text{RM}(1, 3) \rightarrow E_8 \rightarrow V \rightarrow \text{RM}(1, 4)^* \rightarrow \text{RM}(1, 3)$ closes with exactly 1344 equivalences; the induced CSS code is $[[15, 1, 3]]$ with dual $[15, 10, 4]$ and triorthogonality $8/4/2$ [\[E\]](#).

The plane-count Hecke match (2026-08-06, [\[verification/v820_prime_kraus_rm24.py\]](#), 16/16 + 14/14, KRAUS-RM24-RULE-CANONICAL+PLANEFRAMES-EXACT): the C_2 packet pair (A_n, B_n) of the positive lift is carried by the two affine plane frames of (V, ω) — iso (60, Gram $12I+3J$) and non-iso (80, $16I+4J$) — with $A_3 = 12$ / $B_3 = 16$ equal to the per-point iso/non-iso plane completion counts, so $\sigma_3(3) = 28$ and $a_3 = -4$ become plane-count statements, and the graded frame operator realizes $V^*V = \sigma_3(n)I$, $V^*\Gamma V = a_n I$ exactly on $\mathbf{1}^\perp$ for $n = 3, 5, 7$; the rule-A Kraus protocol set is canonically the 105 minimal parity checks of $[15, 10, 4]$ (the literal leg bijection is dead twice — weights and $Sp(4, 2)$ orbits) [\[E\]](#).