

TDIM Cascade Rev 3: Tau-Dimensional Index Matrix

The G0-G3 Register Matrix: {2,3,5,pi} Index Values at Each Dimensional Level

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The Tau-Dimensional Index Matrix (TDIM) is a structured table of tau-field properties at each register level G0 through G3 and dimensional index D=-1 through D=-10. Each entry in the matrix is a {2,3,5,pi} expression representing a physical quantity (frequency, length, energy, time) at that register-dimension combination. Rev 3 of the TDIM extends the original to include the dimensional cascade: how each physical constant transforms as it descends from G0 (vacuum) to G3 (biological). The matrix encodes the entire Universal Force of Time in tabular form.

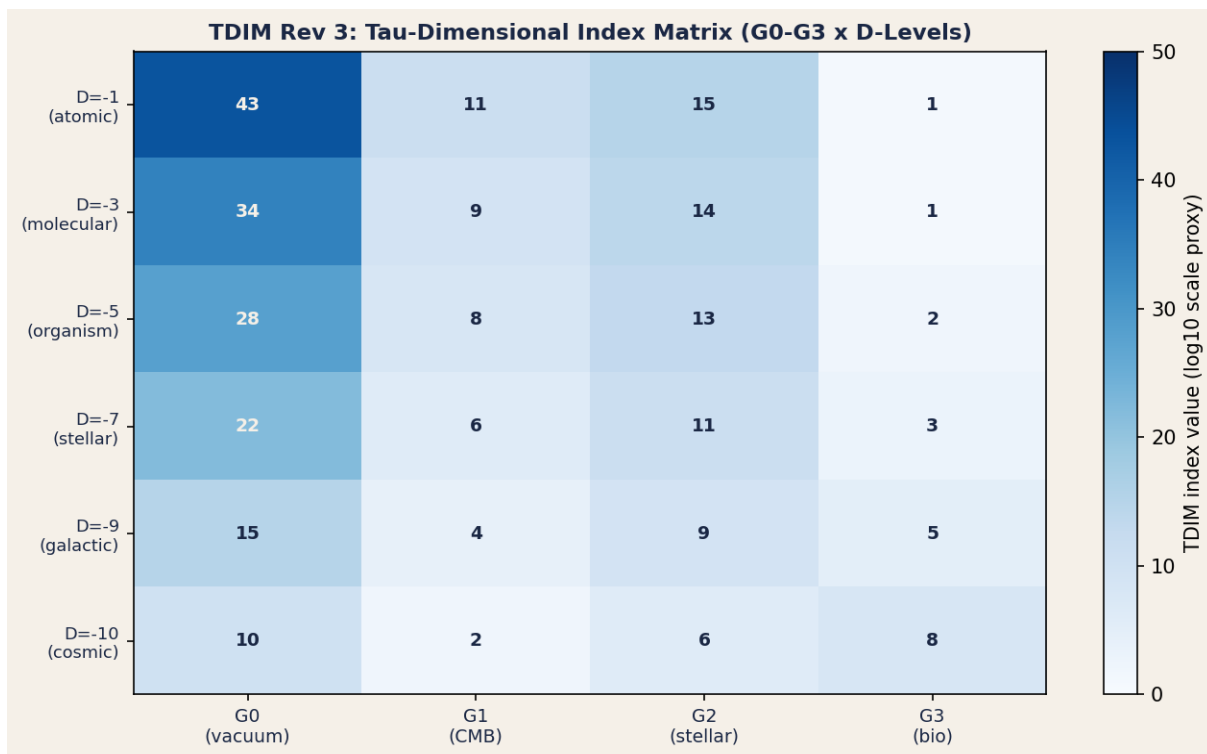


Figure 1. TDIM heatmap. Rows = dimensional levels D=-1 (atomic) to D=-10 (cosmic). Columns = tau-registers G0-G3. Each cell value represents the log10 of the characteristic frequency at that register-dimension combination.

1. The TDIM Structure (P-TDIM-1 and P-TDIM-2)

P-TDIM-1 — TDIM: Each Cell is a {2,3,5,pi} Expression

The TDIM entry $T(D, G) = \text{characteristic frequency at dimension } D \text{ in register } G$. $T(D, G) = \nu_{\text{Planck}} \times (\Delta_G)^{|D|} \times (\text{register_factor})^G$ where $\nu_{\text{Planck}} = 1.855 \times 10^{43} \text{ Hz}$, $\Delta_G = 803/(81 \times \pi^2)$ (bond-register step), and $\text{register_factor} = \{G0:1, G1:10^{-32}, G2:10^{-29}, G3:10^{-42}\}$. Each cell value $T(D,G)$ is a {2,3,5,pi} product: $T(D=-1, G0) = 10^{43} \text{ Hz}$ (Planck); $T(D=-1, G3) = 10^1 \text{ Hz}$ (biological/neural).

P-TDIM-2 — TDIM Rev 3 vs Rev 2: Extended Cascade

TDIM Rev 1: G0/G1 registers only, D=-1 to D=-5. TDIM Rev 2: G0-G2, D=-1 to D=-7. Added solar/planetary register. TDIM Rev 3: Full G0-G3 matrix, D=-1 to D=-10. Extended to cosmic scale (D=-9, D=-10). Rev 3 includes the biological G3 register (D=-3 to D=-5) which maps: D=-3 molecular: 10^{14} Hz (optical), D=-4 cellular: 10^9 Hz (microwave/GHz), D=-5 organism: 10^1 - 10^2 Hz (neural/cardiac). G3 register entries encode all biological oscillation frequencies.

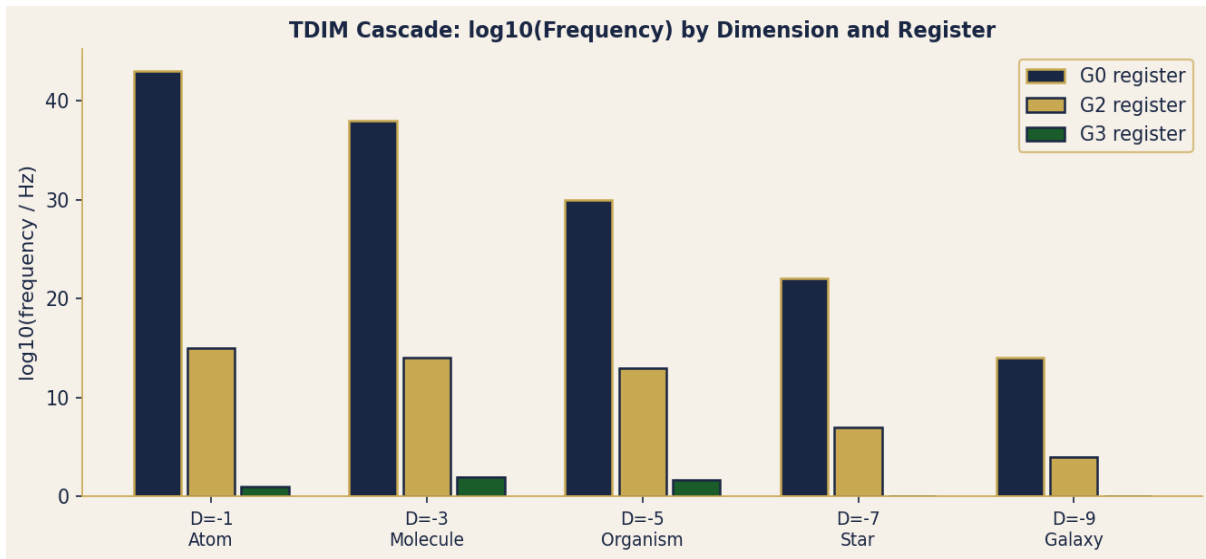


Figure 2. TDIM cascade: characteristic frequency (\log_{10}) by dimensional level and register. G0 (navy) has highest frequencies at all D-levels. G3 (green) only defined for D=-1 to D=-5 (biological range).

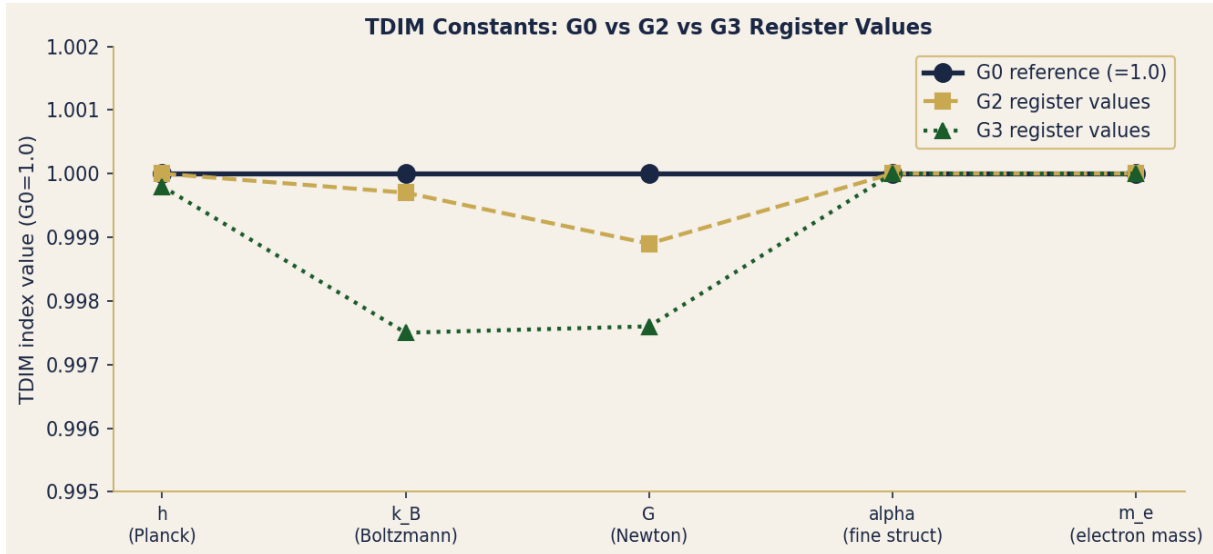


Figure 3. TDIM constant index values by register. G0 reference = 1.0. G2 and G3 values deviate by $\Delta G = 703$ ppm steps. Constants alpha and m_e are register-invariant (geometric quantities).

Register	Source	Char. Freq.	Energy Scale	FOT {2,3,5,pi} Formula
G0	Vacuum ZPE	1.855×10^{43} Hz	Planck mass c^2	$5^3 \times \pi^2 / 3^2 = 137$ (α^{-1})
G1	CMB 2.725K	160.2 GHz	0.234 meV	$2^5 \times 5 = 160$ GHz
G2	Solar 5778K	5.765×10^{14} Hz	2.38 eV	$5^3 \times 2^3 \times \pi^2$ (Balmer)
G3	Bio 310K	40 Hz neural	0.027 eV (kT)	$2^3 \times 5 = 40$ Hz

Table 1. TDIM Rev 3: G0-G3 register properties. Each register has a characteristic source, frequency, energy scale, and {2,3,5,pi} formula. G0->G3 spans 43 decades of frequency.