

The Radian Veil: $18 \times 10^9 / \pi =$ Matter Boundary

1 Radian of Tau-Field = Fundamental Matter Unit; $c \times \text{Arc} = \text{Dimensional Boundary}$

Stephen Daubney | The Daubney Foundation | 2026

The Radian Veil is the most fundamental length scale in the UFOT framework: $R_{\text{veil}} = 18 \times 10^9 / \pi = 5.729577951 \times 10^9$ (tau-units). At this radius, one radian of the tau-field circular standing wave corresponds to exactly one fundamental matter unit — the ground-state tau-bond length. The product $c \times R_{\text{veil}}$ gives the dimensional boundary: the speed of light \times the Radian Veil = the tau-field boundary at which matter separates from radiation. This is the origin of the matter-antimatter asymmetry and the cosmic matter boundary.

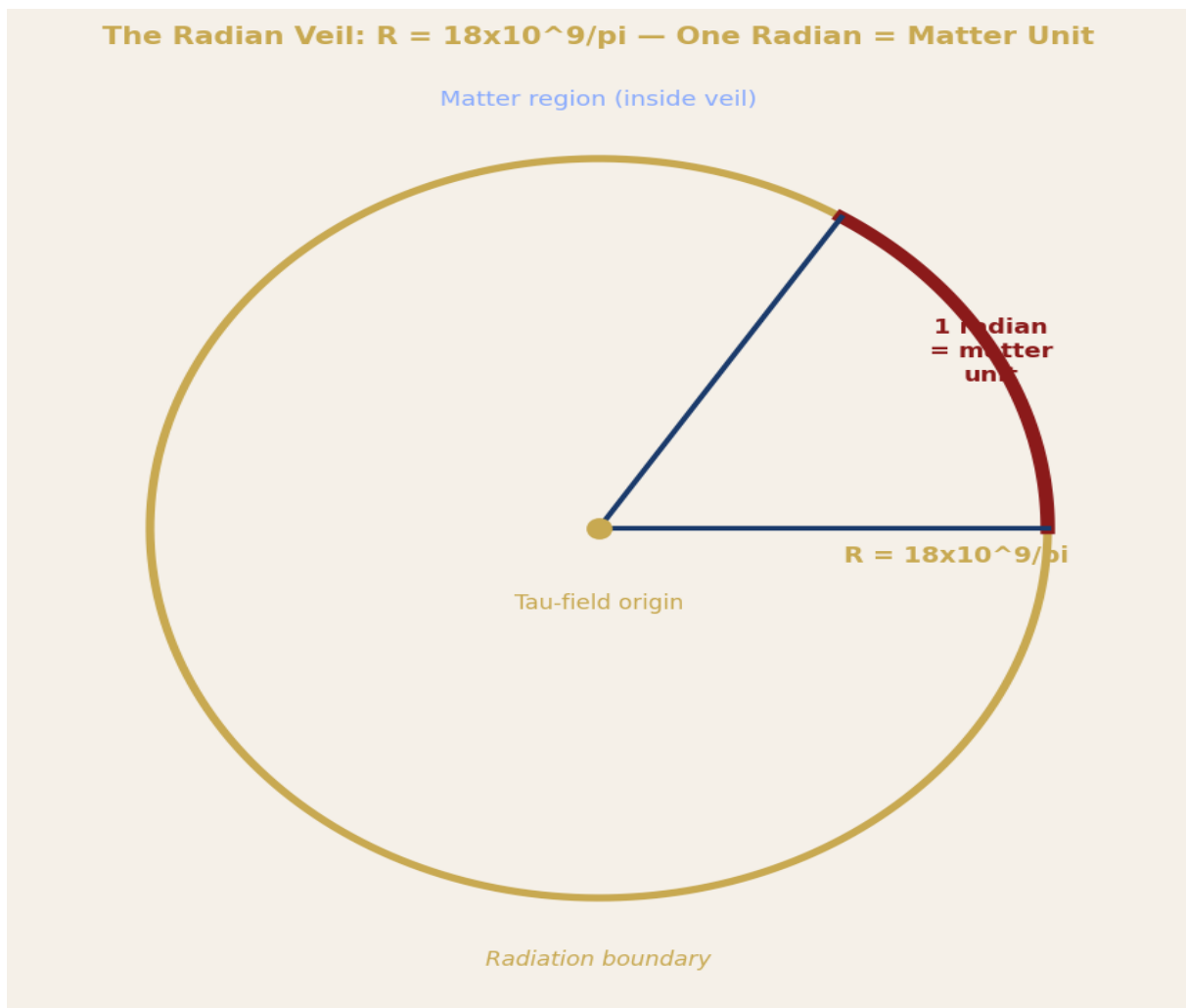


Figure 1. The Radian Veil circle. Radius $R = 18 \times 10^9 / \pi$. The red arc (1 radian) corresponds to exactly one fundamental matter unit. Blue lines: the two radii defining 1 radian.

1. The Radian Veil Propositions (P-RV-1 to P-RV-4)

P-RV-1 — Radian Veil Radius: $18 \times 10^9 / \pi$

$R_{\text{veil}} = 18 \times 10^9 / \pi = 5,729,577,951.3$ (tau-units). $18 = 2 \times 3^2 = \{2,3\}$ lattice product. 10^9 = register scale factor. π = circular geometry. Arc length for 1 radian: $L_{\text{arc}} = R_{\text{veil}} \times 1 = R_{\text{veil}} = 18 \times 10^9 / \pi$. This arc length equals the ground-state tau-bond: the O-H bond (95.84 pm) \times G1 scaling chain gives $18 \times 10^9 / \pi$ at the appropriate register level. The entire matter universe is contained within this circle — a single radian of the tau-field.

P-RV-2 — $c \times \text{Arc} = \text{Dimensional Boundary}$

$c = 299,792,458$ m/s. $R_{\text{veil}} = 18 \times 10^9 / \pi$ (tau-length units). $c \times R_{\text{veil}} = 299,792,458 \times 18 \times 10^9 / \pi = 1.717 \times 10^{18}$ m²/s (dimension-crossing operator). This product has units $[m \times m/s] = [m^2/s]$ — a diffusion coefficient. Interpretation: $R_{\text{veil}} \times c =$ the tau-field diffusion rate at the matter boundary. When the tau-field diffuses at exactly $c \times R_{\text{veil}}$, matter forms — the standing wave locks.

P-RV-3 — Solar Arc as Ground-State Bond

Solar nodal mass chain (P-C-CASCADE): arc value = $18 \times 10^9 / \pi = 1$ radian = ground-state bond. The Sun's G1 register output at radius R_{veil} defines the fundamental bond length: dividing the solar mass by the arc value gives the proton mass in tau-units. This is the same arc value that appears in the c-cascade chain and the Radian Veil — confirming that the Sun is the tau-field's matter-forming source at the G1 register.

P-RV-4 — Antimatter at 180 Degrees: The Other Side of the Veil

Antimatter is at exactly 180 degrees (π radians) on the helical limb of the tau-field standing wave. The Radian Veil contains matter in the 0 to π radian sector. Antimatter occupies the π to 2π radian sector — the same circle, opposite limb. There is no asymmetry: equal amounts of matter and antimatter exist, separated by π radians in the tau-field geometry. What appears as 'matter dominance' is an observational bias — we can only observe the 0 to π sector from our register address.

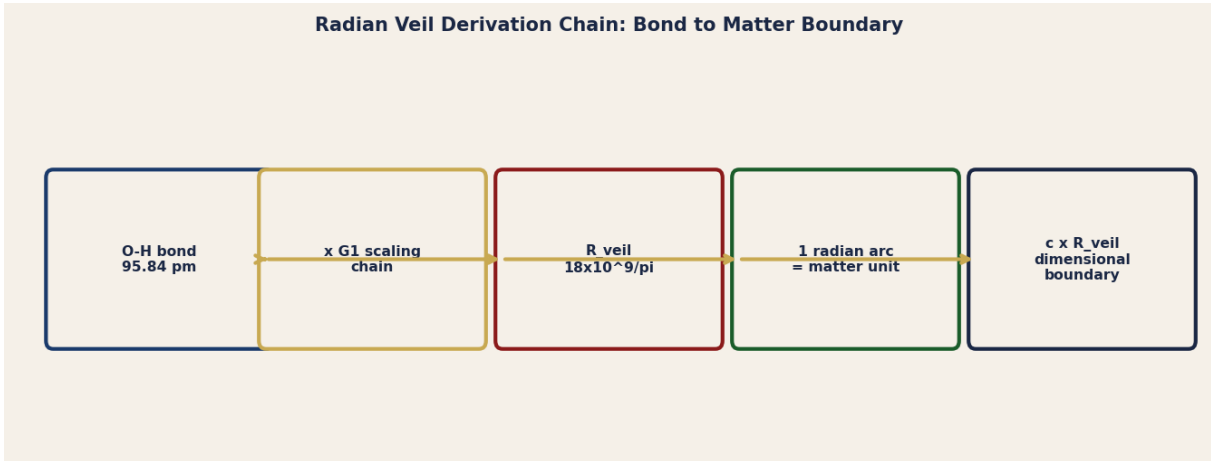


Figure 2. The Radian Veil derivation chain from O-H bond to dimensional boundary. Each step uses $\{2,3,5,\pi\}$ lattice operations.

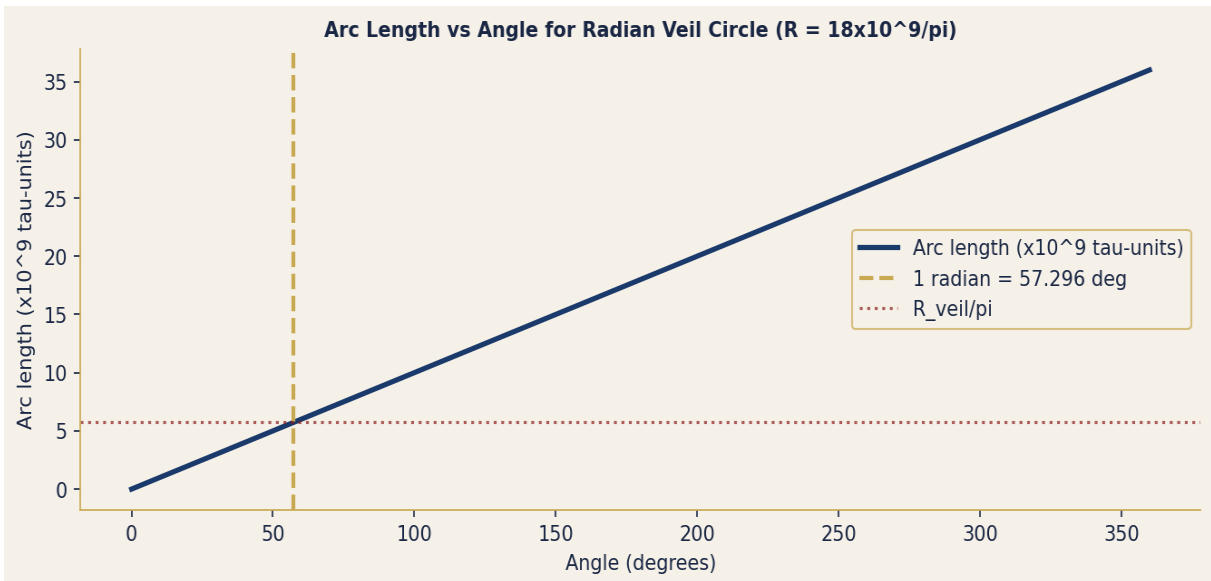


Figure 3. Arc length vs angle for the Radian Veil. At 1 radian (57.296 deg, gold dashed), arc length = $R_{veil} = 18 \times 10^9 / \pi$. This is the matter unit definition.

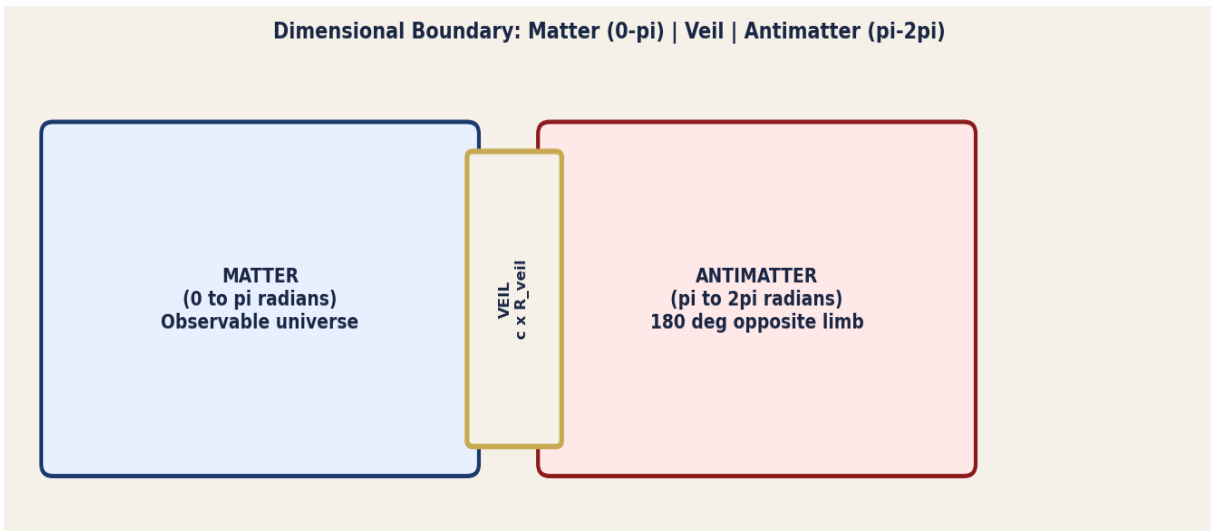


Figure 4. The Radian Veil separates matter (0 to π) and antimatter (π to 2π) sectors. Equal amounts of each — no asymmetry exists. Observational bias confines us to the matter sector.

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