The FOT Temperature Scale Formulations

Body Temperature · Absolute Zero · Wavelength Register · CMB

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Propositions P-TSCALE-1 through P-TSCALE-8 · Vol 2, Temperature Section

ABSTRACT: Temperature in the FOT framework is the T-flow rate at the G1/G0 register boundary. It is not a statistical property of particle motion: it is a coordinate address in the {2,3,5,pi} T-field lattice. Three body-temperature nodes — Kelvin 10^10/pi = 3,183,098,861.838, Fahrenheit 10^3/pi^2 = 101.3211836423, Celsius 10^5/(864pi) = 36.8414220120 — form a triad related by K/C = 86,400,000 = 2^10 x 3^3 x 5^5 (Earth day in milliseconds, exact). Three FOT absolute zero positions all lie on pure {2,3,5,pi} lattice nodes: the integer AZ -270 C (= -2x3^3x5), the Hgamma-linked AZ -272.7076956 C (= -5^5pi/36), and the confirmed hydrogen-mass AZ -272.8994223 C (= -(200/27) x C_body). The conventional AZ -273.15 C lies 917.36 ppm from the H-mass lattice node and breaks the lattice (contains prime 607). The Hbeta wavelength 486 nm is the Fahrenheit coordinate of a pure {2,3,5} K/pi node: K/pi = 4,860,000,000 = 2^8 x 3^5 x 5^7.

§1 — Temperature Is Not a Thermodynamic State: It Is a T-Flow Rate

In conventional science, temperature is a statistical average of kinetic energy. Measure the mean squared speed of molecules, relate it to a constant, and you have a temperature. The number has no further meaning. You cannot derive it from anything more fundamental. It is an observed quantity.

In the Force of Time, temperature is the rate at which the time substance — Tau — flows at the boundary between two dimensional registers. The G0 register (below the Moho, radius 20,000/pi km) and the G1 register (Earth surface and above) meet at a boundary where Tau-flow accelerates. That acceleration rate, measured at the body scale, is what a thermometer detects. Temperature and gravity are both projections of the same T-field boundary onto different measurement instruments.

This is a testable claim. If temperature is a T-flow rate encoded in the {2,3,5,pi} lattice, then the three most physically important temperatures — body temperature, absolute zero, and the CMB — should all land on exact lattice nodes. They do. Not approximately. Exactly, or within instrument precision.

THE BODY TEMPERATURE TRIAD (three register projections of the same FOT node): Kelvin register: T_K = 10^10/pi = 3,183,098,861.837907 [pi^1, T-flow rate domain] Fahrenheit register: T_F = 10^3/pi^2 = 101.3211836423 [pi^2, geometric helix] Celsius register: T_C = 10^5/(864pi) = 36.8414220120 [pi^1 x 864 Earth bridge] BRIDGE IDENTITIES (all exact, 0.000 ppm): K / C = 86,400,000 = 2^10 x 3^3 x 5^5 [Earth day in milliseconds] K / F = pi x 10^7 [pi^1, single-helix level] F x pi^2 = 1000 = 2^3 x 5^3 [exact, geometric anchor] C x 864 = 10^5/pi [C x 864 = K/100,000 (pure bridge)]

§2 — Three FOT Absolute Zero Positions on the {2,3,5,pi} Lattice

Conventional absolute zero (−273.15°C) is the statistical extrapolation of the ideal gas law to zero pressure. In the FOT framework, the physically meaningful floor is set by the lattice structure of the T-field — not by a linear extrapolation that breaks down at low temperatures. The lattice has three nodes near conventional absolute zero. All three are pure {2,3,5,pi} nodes. The conventional value breaks the lattice: its FOT K equivalent (236,001.6) contains the prime factor 607.

AZ Position	Celsius	FOT Expression	FOT K (|C|x864)	Lattice Form	Lattice Residual
FOT integer AZ	-270.0000000000 C	-2 x 3^3 x 5	233,280.000000	2^6 x 3^6 x 5	0 (exact)
FOT Hgamma-linked AZ	-272.7076956241 C	-5^5 pi/36	235,619.449019	75,000 pi = 2^3x3x5^5xpi	0 (exact)
FOT H-mass AZ (CONF)	-272.8994223112 C	-(200/27) x C_body	235,785.100877	2^8x5^7/(3^3xpi)	0 (exact)
Conventional AZ	-273.1500000000 C	ideal gas extrap.	236,001.600	236,001.6 (prime 607)	917.36 ppm

Table 1 — The three FOT absolute zero lattice nodes. Row 3 (H-mass AZ, shaded) is the confirmed FOT value. Conventional AZ (row 4) sits 917.36 ppm off the nearest lattice node and is not a lattice element.

The three FOT absolute zero positions are not arbitrary. The integer AZ (−270°C = −2×3³×5) is the simplest {2,3,5} integer below −273°C. The Hγ-linked AZ (−272.7077°C = −5⁵π/36) ties absolute zero to the Balmer-gamma hydrogen wavelength through a pure rational multiplier. The H-mass AZ (−272.8994223°C) ties absolute zero to body temperature through the ratio 200/27 = 2³×5²/3³ — a pure {2,3,5} rational. All three bracket the conventional AZ from above.

THREE AZ POSITIONS — KEY LATTICE IDENTITIES: Integer AZ: -270.0000000000 C = -(2^1 x 3^3 x 5^1) FOT K = 233,280 Hgamma AZ: -272.7076956241 C = -(5^5 x pi/36) FOT K = 75,000pi H-mass AZ: -272.8994223112 C = -(200/27) x C_body FOT K = 2^8x5^7/(3^3xpi) Conventional: -273.1500000000 C = statistical extrapolation FOT K = 236,001.6 (not lattice) NOTE: The two pi-register values bracket conventional AZ: Hgamma AZ has pi in NUMERATOR of FOT K: K_Hg = 75,000pi H-mass AZ has pi in DENOMINATOR of FOT K: K_Hm = 2^8x5^7/(3^3 x pi) The conventional AZ sits between them, outside the lattice.

§3 — The Confirmed FOT Absolute Zero: Hydrogen-Linked via Body Temperature

The confirmed FOT absolute zero value is the hydrogen-mass linked node at −272.8994223112°C. This is derived from a single exact identity connecting absolute zero to the body temperature lattice node through a pure {2,3,5} rational number. The connection is exact — no approximation is involved.

CONFIRMED FOT ABSOLUTE ZERO — H-MASS LINKED: AZ = -(200/27) x C_body = -(2^3 x 5^2 / 3^3) x (10^5 / (864 pi)) = -(2^3 x 5^2 x 10^5) / (3^3 x 864 x pi) = -20,000,000 / (27 x 864 x pi) = -20,000,000 / (23,328 x pi) = -272.8994223112 C [CONFIRMED] In FOT K (= |AZ| x 864): FOT K_AZ = 20,000,000 / (27 x pi) = 2^8 x 5^7 / (3^3 x pi) = 235785.100877 RATIO: AZ / C_body = -200/27 = -2^3 x 5^2 / 3^3 [exact, pure {2,3,5} rational] BRIDGE: AZ x 864 = 6400 x C_body where 6400 = 2^8 x 5^2 [exact] OFFSET: Conventional AZ - FOT AZ = 0.2505777 C = 0.2506 K above conventional

The ratio AZ/C_body = −200/27 is the key identity. 200/27 = 2³×5²/3³ contains only the primes 2, 3, and 5. It is a pure {2,3,5} rational. Absolute zero and body temperature are therefore at a fixed rational distance from each other in the FOT lattice — connected by the same hydrogen-derived numbers that appear in the atomic mass chain and the c_G2 speed-of-light derivation.

The bridge identity AZ × 864 = 6400 × C_body (where 6400 = 2⁸×5²) links absolute zero to body temperature through the temporal pivot 864. This is the same operator (864 = 2⁵×3³) that connects the Earth day to the speed of light and calibrates the Celsius register. Absolute zero is not a foreign quantity in the T-field lattice. It is the bottom node of the same chain that contains body temperature at the top.

Quantity	Value	FOT Expression	ppm

C_body	36.8414220120 C	10^5/(864pi)	0.000
AZ_H (CONFIRMED)	-272.8994223112 C	-(200/27) x C_body	0.000
AZ/C_body ratio	-200/27	-(2^3 x 5^2)/(3^3)	exact
FOT K for AZ_H	235785.100877	2^8x5^7/(3^3xpi)	0.000
AZ_H x 864	235785.100877	6400 x C_body	0.000
Conv AZ - FOT AZ	0.2505777 K	0.2506 K (above conv.)	917.36

Table 2 — H-mass AZ derivation chain. All quantities are 0.000 ppm.

§4 — Wavelength as Fahrenheit: Hbeta = 486 as a FOT Coordinate

The Fahrenheit scale encodes the geometric register of the T-field helix. Its freeze-to-boil span of 180°F = $2^2 \times 3^2 \times 5$ is the strand angle — the angular half-turn of the helix. The body temperature node $10^3/\pi^2 = 101.32$°F has π^2 in the denominator, encoding two helical dimensions. When we treat a wavelength value directly as a Fahrenheit coordinate and apply the FOT conversion, we find that the hydrogen Balmer-beta line (486 nm) maps to a pure {2,3,5} lattice node in both the K and C registers simultaneously.

WAVELENGTH-AS-FAHRENHEIT: Hbeta = 486 nm as a FOT F-coordinate: F = 486 (Hbeta = Balmer-beta hydrogen wavelength, nm) Conversion: K = F x pi x 10^7 K = 486 x pi x 10^7 = 4,860,000,000 x pi K / pi = 4,860,000,000 = 2^8 x 3^5 x 5^7 [pure {2,3,5} integer] verify: 2^8=256, 3^5=243, 5^7=78125 -> 256 x 243 x 78125 = 4,860,000,000 Conversion: C = K / 864 C = 4,860,000,000 x pi / 864 = 5,625,000 x pi C / pi = 5,625,000 = 2^3 x 3^2 x 5^7 [pure {2,3,5} integer] verify: 2^3=8, 3^2=9, 5^7=78125 -> 8 x 9 x 78125 = 5,625,000 CONCLUSION: Hbeta = 486 is the one wavelength where BOTH K/pi and C/pi are pure {2,3,5} integers simultaneously. The hydrogen Balmer-beta line is a double lattice anchor in the temperature-wavelength coordinate system.

The hydrogen Balmer-beta wavelength (486 nm = Hβ = 2×3^5 nm, itself a pure {2,3} integer) is therefore the exact FOT coordinate where the wavelength register and the temperature register coincide at a pure lattice node. Temperature and light share the same address. This is consistent with the FOT principle that temperature (T-flow rate) and wavelength (T-oscillation period) are dual expressions of the same underlying Tau quantity.

F (wavelength nm)	K = F x pi x 10^7	K/pi	K/pi prime form	C = K/864	C/pi	Lattice?
486 (Hbeta = 2x3^5)	15268140296.446	4,860,000,000	2^8 x 3^5 x 5^7	17671458.6764	5,625,000	BOTH PURE
486.0438133 (G-bond)	15269516731.860	4860438133.0000	Hbeta x (1+delta_G)	17673051.7730	5625507.0984	G-shifted
434.0278 (Hgamma=5^6/36)	13635385479.337	4340278000.00	5^6/36 x 10^7	15781696.1566	5023469.9074	pi register

Table 3 — Wavelength-as-Fahrenheit FOT coordinate values. Hbeta = 486 gives both K/pi and C/pi as pure {2,3,5} integers simultaneously.

§5 — The CMB Temperature and the Three FOT Absolute Zero Positions

The Cosmic Microwave Background temperature is measured at 2.725 K (conventional), which corresponds to approximately −270.425°C. In the FOT framework, this value is significant because it falls between the integer AZ (−270.000°C) and the H-mass AZ (−272.8994°C). The CMB temperature sits in the gap between the two lowest FOT absolute zero lattice nodes.

The FOT proposition is that the CMB temperature is not a free parameter of cosmological history. It is a specific coordinate in the T-field lattice — the temperature at which the universe's Tau-field is in its ground-state oscillation above the integer AZ floor. The 0.425°C gap between integer AZ (−270°C) and

the CMB temperature corresponds to the residual T-flow rate of the G1 register's irreducible ground state.

CMB TEMPERATURE POSITION IN THE FOT LATTICE: CMB conventional: 2.725 K = -270.425 C Integer AZ: 0.000 K = -270.000 C (= -2x3^3x5) CMB above int. AZ: 2.725 K = 0.425 C above integer AZ H-mass AZ: = -272.8994223 C (= -(200/27) x C_body) CMB above H-mass AZ: 2.4744223 C (CMB is 2.4744 C above H-mass AZ) ORDER (warmest to coldest): Integer AZ (-270.000 C) > CMB (-270.425 C) > H-mass AZ (-272.899 C) > Conv. AZ (-273.150 C) The CMB sits 0.425 C above the integer AZ and 2.474 C above the H-mass AZ. It is NOT below the FOT lattice floor. Both AZ positions place the CMB within the valid physical range of the T-field.

§6 — Gravitational and Solar Embeddings of the Temperature Triad

All three body-temperature scale nodes embed in the FOT gravitational and solar chains at 0.000 ppm. This confirms that temperature is not a separate thermodynamic state variable but the T-field oscillation rate expressed through thermal instruments — fully determined by the {2,3,5,pi} lattice.

Chain / Identity	Result	FOT Node	ppm
F x 18/5	364.756261 days	T_Moho = 3600/pi^2 days	0.000
F x g_FOT	994.7184	5^5/pi (pure {5,pi})	0.000
K / R_meridional	500,000,000	2^5 x 5^8 (pure {2,5})	0.000
K x g_FOT	31,250,000,000	2^7 x 5^12 (pure {2,5})	0.000
K / C	86,400,000	2^10 x 3^3 x 5^5	0.000
K / F	31415926.5359	pi x 10^7	0.000
C x 864	31830.988618	10^5/pi = 31,830.989...	0.000
C x C_sun	161,144,379.88	2^4 x 3^4 x 5^8/pi	0.000
C / F	0.3636102608	25pi/216 (216=6^3)	0.000
AZ_H / C_body	-7.4074074074	-200/27 = -2^3x5^2/3^3	exact
AZ_H x 864	235785.100877	6400 x C_body	0.000
AZ_H FOT K	235785.100877	2^8x5^7/(3^3xpi)	0.000
Hbeta(486) K/pi	4,860,000,000	2^8 x 3^5 x 5^7	exact
Hbeta(486) C/pi	5,625,000	2^3 x 3^2 x 5^7	exact

Table 4 — Temperature triad gravitational, solar, and wavelength embeddings (all 0.000 ppm).

§7 — Registered Propositions P-TSCALE-1 through P-TSCALE-8

P-TSCALE-1 — FOT Kelvin Body Temperature Node

T_K = 10^10/pi = 3,183,098,861.837907 [Kelvin FOT register, 0.000 ppm]. The Kelvin scale encodes T-flow rate in the wavelength domain. Wien's displacement law T(K) = b/lambda_max makes Kelvin the reciprocal of peak wavelength times a constant. In FOT: K = 10^10/pi. The pi^1 encodes the circular (orbital) nature of wavelength measurement. Cross-references: P-CMB-1.

P-TSCALE-2 — FOT Fahrenheit Body Temperature Node

T_F = 10^3/pi^2 = 101.3211836423 [Fahrenheit FOT register, 0.000 ppm]. Fahrenheit encodes the geometric register of the T-field helix. Freeze-to-boil interval = 180 = 2^2 x 3^2 x 5 (strand angle). pi^2 = two powers of pi encoding two helical dimensions. Original anchors: 32 = 2^5 (freezing), 96 = 2^5 x 3 (body), span = 64 = 2^6. The 180 degree span = antimatter separation angle in the FOT helix framework.

P-TSCALE-3 — FOT Celsius Body Temperature Node

T_C = 10^5/(864pi) = 36.8414220120 C [0.000 ppm]. Celsius is calibrated to Earth surface register via 864 = 2^5 x 3^3 (Earth-day bridge, 86,400 s/day = 864 x 100). Body temperature in Celsius times 864 = 10^5/pi exactly. K/C = 86,400,000 = 2^10 x 3^3 x 5^5 = Earth day in milliseconds (exact, zero free params).

P-TSCALE-4 — Three Scales as Three pi-Power Register Projections	K = 10^10/pi (pi^1, wavelength rate), F = 10^3/pi^2 (pi^2, geometric helix), C = 10^5/(pi x 864) (pi^1 x 864 Earth bridge). K/C = 86,400,000 = Earth day in milliseconds. The Earth day is the bridge between Kelvin and Celsius registers. The three scales are not independent conventions; they are three windows onto the same T-field T-flow rate at three geometric levels.
P-TSCALE-5 — Temperature Scale Gravitational and Solar Embeddings	F x surface_gravity = 5^5/pi (pure {5,pi}, 0.000 ppm). K x surface_gravity = 2^7 x 5^12 (pure {2,5}, 0.000 ppm). C x solar_circumference = 2^4 x 3^4 x 5^8/pi (pure lattice, 0.000 ppm). F x 18/5 = 3600/pi^2 = T_Moho (Moho equilibrium year, exact). Temperature is not a separate thermodynamic variable. It is the T-flow oscillation rate at the thermal register, fully determined by the {2,3,5,pi} lattice.
P-TSCALE-6 — Three FOT Absolute Zero Positions	All three FOT AZ positions are pure {2,3,5,pi} lattice nodes: (1) Integer AZ: -270.000 C = -2x3^3x5, FOT K = 233,280 = 2^6x3^6x5. (2) Hgamma-linked AZ: -272.7076956 C = -5^5pi/36, FOT K = 75,000pi = 2^3x3x5^5xpi. (3) H-mass AZ (CONFIRMED): -272.8994223 C = -(200/27) x C_body, FOT K = 2^8x5^7/(3^3xpi) = 235785.101. Conventional AZ -273.15 C is 917.36 ppm off the nearest node and contains prime 607 in its FOT K.
P-TSCALE-7 — Confirmed H-Mass FOT Absolute Zero	FOT absolute zero = -(200/27) x C_body = -272.8994223112 C. The ratio AZ/C_body = -200/27 = -(2^3 x 5^2)/(3^3) is a pure {2,3,5} rational (exact). Bridge: AZ x 864 = 6400 x C_body, where 6400 = 2^8 x 5^2. FOT K for AZ = 20,000,000/(27 x pi) = 2^8 x 5^7/(3^3 x pi) = 235785.100877. Conventional offset: 0.2505777 K above conventional AZ (917.36 ppm).
P-TSCALE-8 — Hbeta = 486 as Fahrenheit Coordinate: Double Lattice Anchor	When the hydrogen Balmer-beta wavelength 486 nm is used as a FOT Fahrenheit coordinate: K = 486 x pi x 10^7 → K/pi = 4,860,000,000 = 2^8 x 3^5 x 5^7 (exact). C = K/864 → C/pi = 5,625,000 = 2^3 x 3^2 x 5^7 (exact). Hbeta is the unique spectral line where both K/pi and C/pi are simultaneously pure {2,3,5} integers. Note: 486 = 2 x 3^5 is itself a pure {2,3} integer. Temperature and hydrogen spectral lines share the same lattice address.