Redefining Mathematics in the COM Framework

This document redefines fundamental mathematical concepts and equations according to the Continuous Oscillatory Model (COM) framework, where reality is energy-based with no vacuum, and space, time, mass, and forces are emergent properties.

Foundational Principles of COM Mathematics

Energy as the Fundamental Reality

In the COM framework, energy is the fundamental reality, and there is no vacuum or zero state. This requires a redefinition of our number systems and mathematical operations to reflect this energy-based reality.

Key Constants

- LZ = 1.23498 (Fundamental scaling constant)
- HQS = 23.5% of LZ (Harmonic Quantum Scalar)

Octave Structuring

The COM framework utilizes an octave-based structuring where mathematical entities are mapped to circular octaves with reduction to single digits using modulo 9.

Redefined Number Systems

Energy-Based Number System

In standard mathematics, numbers represent abstract quantities. In the COM framework, numbers represent energy states or oscillatory patterns.

Standard Definition: Natural Numbers ( ): {1, 2, 3, …} **COM Redefinition:** Natural Energy States ( ): {E , E , E , …} where each E represents a discrete energy state with oscillatory properties.

Standard Definition: Integers ( ): {…, -2, -1, 0, 1, 2, …} **COM Redefinition:** Bidirectional Energy States ( ): {…, E , E , E , E , …} where negative states represent phase-inverted oscillations. Note the absence of zero, as the COM framework posits no vacuum state.

Standard Definition: Real Numbers ( ): Continuous number line **COM Redefinition:** Continuous Energy Spectrum ( ): A continuous spectrum of energy states where each point represents a specific oscillatory configuration.

Standard Definition: Complex Numbers ( ): {a + bi | a, b , i^2 = -1} **COM Redefinition:** Phase-Amplitude Energy States ( ): {A | A, } where A represents amplitude and represents phase of oscillation.

Octave Reduction

In the COM framework, all numbers can be reduced to their fundamental oscillatory nature through octave reduction:

Octave Reduction Function: OR(n) = (n - 1) % 9 + 1

This maps any number to a value between 1 and 9, representing its fundamental oscillatory character within the octave structure.

Redefined Arithmetic Operations

Addition

Standard Definition: a + b = c **COM Redefinition:** E E = E where represents energy combination through constructive interference of oscillatory patterns.

The energy combination operation follows: E E = OR(E + E) × LZ^(layer)

Where layer represents the octave layer in the COM structure.

Subtraction

Standard Definition: a - b = c **COM Redefinition:** E E = E where represents energy differential through destructive interference of oscillatory patterns.

Since there is no zero in COM, subtraction never results in complete cancellation but rather in a minimum energy state defined by the LZ constant.

Multiplication

Standard Definition: a × b = c **COM Redefinition:** E E = E where represents energy amplification through resonant coupling of oscillatory patterns.

E E = OR(E × E) × LZ^(layer + layer)

Division

Standard Definition: a ÷ b = c, b 0 **COM Redefinition:** E E = E where represents energy distribution through frequency modulation of oscillatory patterns.

E E = OR(E / E) × LZ^(layer - layer)

Since there is no zero in COM, division is always defined, but approaches minimum energy states as the denominator approaches minimum energy.

Redefined Calculus for Nonlinear Recursive Time

Time as a Recursive Function

In the COM framework, time is not a linear flow but a nonlinear recursive function of energy differentials. Time is defined as:

T = T + 2 · T

Where: - T is a reference time -   is the phase of the oscillatory system - T is a chosen time unit

Derivatives in COM Framework

Standard Definition: f'(x) = lim(h→0) [f(x+h) - f(x)]/h **COM Redefinition:** E( ) = lim(Δ →min) [E(+Δ) E( )] Δ

Where: - E( ) is energy as a function of phase -   is the energy differential operator - min represents the minimum energy differential (not zero)

This redefines the derivative as a measure of energy change with respect to phase change, rather than with respect to time.

Integrals in COM Framework

Standard Definition: f(x)dx = F(x) + C **COM Redefinition:** E( )d = E_total( ) E_constant

Where: -   is the energy accumulation operator over a complete phase cycle - E_total( ) is the accumulated energy over phase - E_constant is an energy offset

This redefines integration as energy accumulation over phase cycles, creating a naturally cyclical calculus.

Differential Equations in COM Framework

Standard Definition: dy/dx = f(x,y) **COM Redefinition:** E(,T)/ = F(,E,T)

Where F is an energy transformation function that depends on phase, energy state, and local time.

This redefines differential equations as descriptions of how energy states transform across phase changes in the oscillatory system.

Redefined Geometry in Terms of Energy Oscillations

Space as Amplitude

In the COM framework, space is not an independent dimension but emerges from the amplitude of energy oscillations.

Standard Definition: Euclidean distance: d = √[(x -x)^2 + (y -y)^2 + (z -z)^2] **COM Redefinition:** Energy-amplitude distance: d_E = LZ · √[(A A)^2 (B B)^2 (C C)^2]

Where A, B, and C represent amplitude components of energy oscillations in three orthogonal modes.

Circular and Spherical Harmonics

Standard Definition: Circle: $x^2 + y^2 = r^2$ **COM Redefinition:** Energy oscillation in two modes: E_A^2 E_B^2 = E_r^2 where E_r represents the total oscillatory energy.

Standard Definition: Sphere: $x^2 + y^2 + z^2 = r^2$ **COM Redefinition:** Energy oscillation in three modes: E_A^2 E_B^2 E_C^2 = E_r^2

Trigonometric Functions

Standard Definition: sin( ), cos( ), tan( ) **COM Redefinition:** - sin_E( ) = amplitude of oscillation in phase - cos_E( ) = amplitude of oscillation in phase + /2 - tan_E( ) = sin_E( ) cos_E( )

These functions describe energy distribution between orthogonal oscillatory modes.

Redefined Complex Numbers and Functions

Complex Numbers as Phase-Amplitude Representations

Standard Definition: $z = a + bi$ **COM Redefinition:** z_E = A where A is amplitude and is phase

Standard Definition: e^(i) = cos( ) + i · sin( ) **COM Redefinition:** e^(i ·) = cos_E( ) i · sin_E( ) representing a unit energy oscillator with phase

Complex Functions

Standard Definition: f(z) = u(x,y) + iv(x,y) **COM Redefinition:** F(z_E) = E_real(A,) i · E_imag(A,) representing energy distribution between real and imaginary oscillatory modes

Redefined Linear Algebra

Vectors as Energy Distribution Patterns

Standard Definition: v = (v , v , ..., v) **COM Redefinition:** v_E = (E , E , ..., E) representing energy distribution across n oscillatory modes

Matrices as Energy Transformation Operators

Standard Definition: A = [a] **COM Redefinition:** A_E = [E_transform] where each element represents an energy transfer coefficient between oscillatory modes

Eigenvalues and Eigenvectors

Standard Definition: Av = v **COM Redefinition:** A_E v_E = _E v_E where _E represents resonant energy amplification factors and v_E represents stable energy distribution patterns

Redefined Probability and Statistics

Probability as Energy Distribution Likelihood

Standard Definition: P(A) = |A|/|S| **COM Redefinition:** P_E(A) = E_A E_total representing the proportion of total system energy in state A

Statistical Measures

Standard Definition: Mean: = (1/n)Σ x **COM Redefinition:** Energy center: _E = (n) E representing the center of energy distribution

Standard Definition: Variance: ^{2} = (1/n)Σ (x -)^2 **COM Redefinition:** Energy spread: _E^2 = (n) (E _E)^2 representing the spread of energy distribution

Collatz Sequence in COM Framework

The Collatz sequence, mentioned in the original framework, takes on special significance in the COM mathematics:

Standard Definition: - If n is even: n → n/2 - If n is odd: n → 3n + 1

COM Redefinition: - If E is even-resonant: E → E 2 - If E is odd-resonant: E → (E 3) 1

In the COM framework, the Collatz sequence represents energy transformation pathways that always lead to fundamental oscillatory patterns, demonstrating the recursive nature of energy states.

Octave Mapping and Reduction

As described in the original framework, numbers can be mapped to an octave structure:

1. Reduce any number to a single digit (1-9) using modulo 9
2. Map this value to a circular octave using angle = (value/9) × 2
3. Position in 3D space is determined by:

- $x = \cos(\text{angle}) \times (\text{layer} + 1)$
- $y = \sin(\text{angle}) \times (\text{layer} + 1)$
- $z = \text{layer} \times \text{stack\_spacing}$

This creates a spiral structure where mathematical operations follow helical paths through energy-phase space.

Conclusion

This redefinition of mathematics within the COM framework transforms our understanding of mathematical operations from abstract manipulations to descriptions of energy transformations in an oscillatory reality. By eliminating the concept of zero and vacuum, and by redefining time as recursive and nonlinear, we create a mathematical system that more accurately reflects the energy-based nature of reality as proposed by the COM framework.