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Cyclic Matter-Energy Phasic Equivalence

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Abstract

Einstein described matter and energy as the same thing, matter being energy condensed to a slow vibration. Physical theories today use continuous motion, time, and dimensionality of matter yet problems persist in understanding observed discrete quantum phenomena. This article introduces a novel discrete modeling system for classical (non-relativistic) and quantum mechanics, capable of maintaining a quantum continuum using cyclic signaling and concept phasic transitions. The model describes a hypothesized limit for matter that does not necessitate a limit for information or equivalent energy in a continuum. The model uses a zero-D point (without mass, matter, or energy) as a relative location. Integrals of displacement utilize dimensional geometric metrics, instead of derivatives. Considerations suggest that as speed/vibration increases, a threshold is reached whereby matter begins a phasic transition into stable equivalent energy. A continuum exists for an object's matter-energy equivalence travelling in a loop with rotational (orbit-like) motion and cyclic phasic transitions between matter-energy states. Adding straight-line motion postulates a coil concept with rotating 2D waves in circular polarization, the speed of light barrier, particle-wave-duality, and measured particles in straight line. Expressed change in the model uses geometric outputs *in* a point of discrete time. Measurable relative cyclic signals can assign discrete time points and sets relative sample and frame (more than one sample) periods, limited by technology not definition. A temporal period frame of reference is unique to both inertial and observer frames of reference. A cyclic coil concept combined with phasing of matter-energy is explored in relation to strong and weak interactions using a single description. The concept also briefly considers alignment with phenomena showing strong forces diminishing at higher energies.

Kýklos; unifying continuous and discrete time

Spacetime modeling passes continuous matter (with or without mass) *through* space and continuous time. In contrast to Einstein who dropped hypotheses of absolute time and space,[1] the introduced Kýklos (Ky) system[2; 3] (coined after the Greek word for circle) maintain these hypotheses. Without using observer or inertial frames of reference, we use both continuous and uniform time, applying dimensional measures, to record absolute time between recurrent object-relative signal inputs (cycle and object specific) (Fig 1.). Continuous time has infinite intervals, smaller intervals than periods between discrete measurable signals. Cyclic and object-relative signal points introduce Ky spatial and temporal metrics capturing relative distances (S_n), and object-relative cyclic time (T_{sn}) as unique cyclic fundamental elements (Fig 1B and C). Converted to scaled geometric metrics, models are constructed upon a temporal period frame of reference, the same timepoint fundamental elements are measured (Fig 1C). This frame includes an interval of time, capturing period change of a dynamical system, expressed at an instant of sampled time. Focus here is on 3D orbital model (coil) with limits opening up considerations in quantum physics.

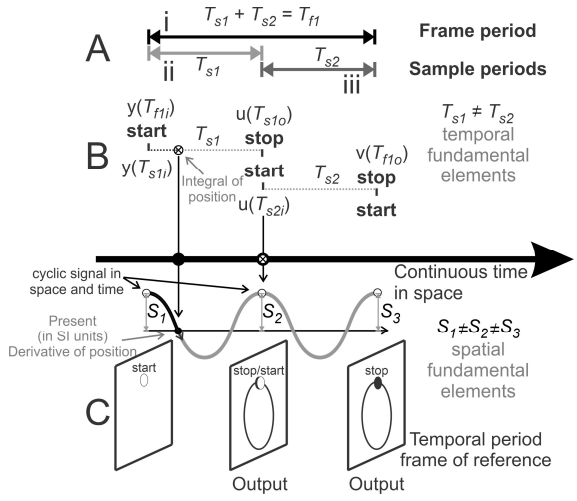

Figure 1. Unification of discrete and continuous time modeling in dynamical systems. S = spatial, T = temporal, s = sample, f = frame, I = input, o = output**,** y/u = reference frame**.** (*image* credit: Modified from Moore, submitted)

Cyclic model for matter-energy phasing; coil concept

Quantum particles are typically imagined as traveling in a straight line, consistent to when they are measured. Cyclic orbits are not yet considered, a logic-based assumption made from this initial thought experiment. A loop/coil concept is imagined using three steps, the first being an equivalent-energy essence, without motion. As the essence slows its vibration, a phasic transition between matter and energy begins, a loop (orbit-like) motion commences

due to added orbital momentum. The loop can transition into a coil with relative movement in an orthogonal plane to the orbit. As speed (or vibration) decreases further, the phasic transition to matter completes. The opposite is true for matter, as matter accelerates to the speed of light, or increases in vibration, it begins a matter-energy phasic transition.

The model potentiates a dimensional illusion, like a static wagon-wheel effect, where a particle is seen only when observed. Cyclic appearance of relative movement of particles would logically create the appearance of points along a straight line (Fig. 2B). Within the phasic coil concept, an assumption is made that an object/particle can be described using orbital motion characterizable as a 2D wave (Fig. 2C), or a rotating 2D wave consistent with circular polarization.

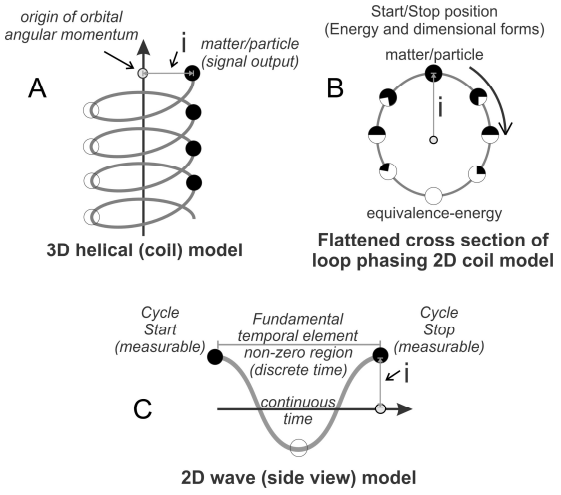

Figure 2. Particle/energy transition; models of circular polarization; spin and orbital angular momentums. (A) Path of particle/energy in a rotating 2D wave consistent with circular polarization creating 3D coil, or helical orbit. **(B)** Loop with orbiting phasing matter-energy equivalence. **(C)** 2D wave removing circular polarization movement. i = spatial fundamental element captured at signal output. (image credit: Modified from Moore, submitted)

Transition between matter and equivalence-energy is conceptual similar with Plato's description of essence, described as being both the same and together. We are also consistent with Born's 1938 suggestion that quantum theory and relativity is unified by "the motion of a free particle in quantum theory is represented by a plane wave".

It is postulated that observations and descriptions of phenomena during this phasic transition are the subject matter for quantum physics.

Here we apply the Ky system's definition for object-relative zero-D points, non-rotating and with no mass, matter, or energy- equivalence.[2; 3] In contrast to relativistic Brent-Wigner distribution and Newton's zero-D point that include mass, here a point in the model is a zero-D location. Unlike S-matrix theory, non-dimensional qualities and processes are not ignored in the coil concept.

The Ky system unifies continuous and discrete time modeling. To do this, technology for standardized uniform and linear time is required, as well as recurrent object-relative discrete signal inputs. Recurrent cyclic signals used by ancient civilizations, like the Sun at zenith (day), New Moon (month), or sunrise summer solstice (year), provide signals for classical Ky modeling. On a quantum scale, discrete signals with measurable properties are used the same way. Using ancient timekeeping principles, temporal fundamental element, including a standardized object-relative Planck time limit, is a temporal element that can be divided and subdivided into $12(30^n) = 360$ units (where n=1) of cyclic and uniform time. In both quantum and classical scales, signals are not considered naturally periodic, meaning equivalent each cycle, an ideal environment for Ky modeling.

When considering planets, there are two types of rotational momentum, spin angular momentum (about centre of mass) and orbital angular momentum. A coil concept offers an analogous situation at the quantum scale as a particle can both spin and have circular polarization in a phasic energy-matter state.

It is known that the state of a system is represented by a wave function with a system momentum. For n particles, a function of the systems momentum is all the individual particles P_1, P_2, P_3… creating a superposition of all possible final states wave function. In a coil concept, within the phasic zone between matter and energy, a system with n particles sharing the same wave function can be imagined as a twirling tunnel of energy and matter, with each n particle shifting between equivalent-energy and an observed particle.

Interactions from phasic transitions within coil

The model suggests it is possible for the Ky system to use a gradient state of matter/energy as separable signals for discrete time modeling that begin to occur near the speed of light. As energy, speed, or vibration increases, properties of the phasic transition shift, yet conservation of matter-energy equivalence is maintained. It also offers a concept for describing probabilities and strength of interactions in quantum

physics. A dynamical system is in flux and continually changing so particle, or object, has unique wave functions, angular momentum, and coordinates each cycle.

Strength of interactions are hypothesized as being based on the phased state of matter-energy equivalence. The stronger the phase of matter then the stronger the interaction and higher collision probability. Therefore, matter (particles) should exist where energy is weakest (Fig. 3A and C), implying collisions have a greater probability in a low energy state. The model also supports asymptotic freedom in that interactions between particles become weaker as energy scales increases and dimensional length scale decreases, or in essence, less applicable.

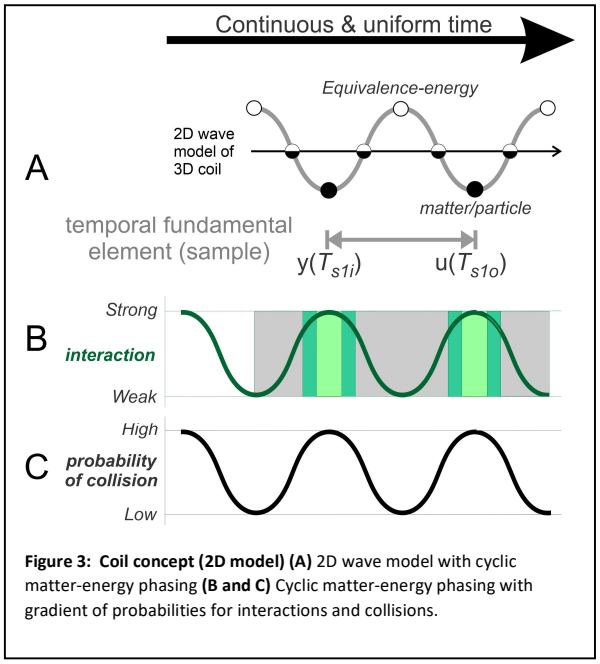

Figure 3: Coil concept (2D model) (A) 2D wave model with cyclic matter-energy phasing **(B and C)** Cyclic matter-energy phasing with gradient of probabilities for interactions and collisions.

Fundamental forces, except gravity, have messenger particle(s) that lead to the hypothesis gravity may as well, a graviton. Here, waves can exist without particles, consistent with current thoughts that gravity travels at the speed of light and has no dimensional particle attributes like mass or radius. This proposes gravity can not slow to a point of becoming matter and thus may have unique properties from a matter-energy equivalence wave. Following this proposal, gravity would be a force energy rather than a force particle and opens new directions for conceptual exploration of gravitational influences on matter, matter-energy equivalence, or equivalent-energy.

In an initial thought experiment for black holes, the model implies matter is accelerated to a dimensional limit whereby an object enters cyclic phasing from matter into equivalent-energy near the speed of light. The proposal abstractly aligns with black hole evaporation suggesting matter would be accelerated to the speed of light at the event horizon where it can be converted into stable equivalent-energy. This concept is consistent with Schwarzschild proposed acceleration to the speed of light at the event horizon.

Discussion and future directions

This is a thought experiment based on a novel discrete modeling system, Kýklos, applicable to both classical (non-relativistic) and quantum physics. The result proposes a cyclic phasic matter-energy transition with a dimensional limit near the speed of light. Cycle specific measurable quantum signals are used as discrete time inputs, but the model does not necessitate a limit for information or equivalent-energy. We proposed matter-energy equivalence in a coil is consistent with 2D waves in circular polarization, the speed of light barrier, particle-wave-duality, and measured particles in straight line as well as considerations for interaction strengths and collision probabilities. A coil concept is largely unexplored, including no current considerations for added dimensions which contrasts with string theory and thoughts on relativistic doppler effects. The concept is consistent with the unification proposal for quantum theory and relativity proposed by Born considering “the motion of a free particle in quantum theory is represented by a plane wave”.

References

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