Subquantum Kinetics

Invented by Dr. Paul A. LaViolette (1947-2022)

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Subquantum Kinetics

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Explanation of Model G in Subquantum Kinetics

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Model G Vortical Motion Group, July 2020

See @
https://www.researchgate.net/publication/342393172_EXPLANATION_OF_MODEL_G_IN_SUBQUANTUM_KINETICS

Introduction to SQK

"In contrast to the conventional paradigm, the methodology presented here, henceforth referred to as subquantum kinetics, conceives process, not structure, to be the basis of physical existence. This new approach to physics postulates an active, interactive subquantum substrate whose processes give birth to and continually sustain the physical form that makes up our Universe.

Subquantum kinetics is a novel microphysics paradigm that incorporates open system concepts previously developed in the fields of general system theory and nonequilibrium Thermodynamics." [SQK book 4th ed.]

So we are treating nature and subatomic particles as open systems, which leads to a very different interpretation and mathematical description of the same phenomena that conventional physics deals with.

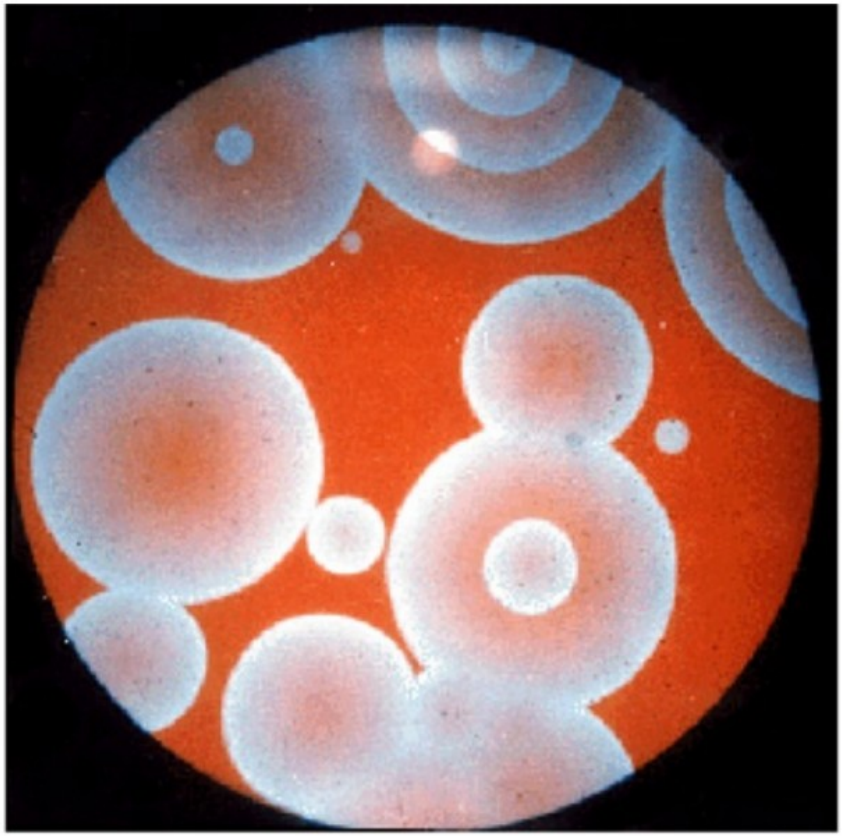
History of SQK

1. SQK is derived from → open reaction systems (ORS) which spontaneously evolve well-ordered wave patterns.
2. ORS → pioneered in 1952 by Alan Turing → explanation for the symmetry-breaking stage of embryonic development.
3. In ~1958, Belousov discovered that a solution containing bromate ions, malonic acid, sulfuric acid, and a small amount of cerous ions will spontaneously oscillate, as an ORS.

History of SQK

4. In 1970, Zhabotinskii and Zaikin reported that a modified version of this reagent would produce slowly moving concentration fronts called chemical waves.
5. These reaction-diffusion waves were made visible as changes in color (between red and blue) when the oxidation-reduction indicator ferroin was added to the reacting solution; see Figure on next slide. Such patterns are sometimes termed Turing patterns.

History of SQK

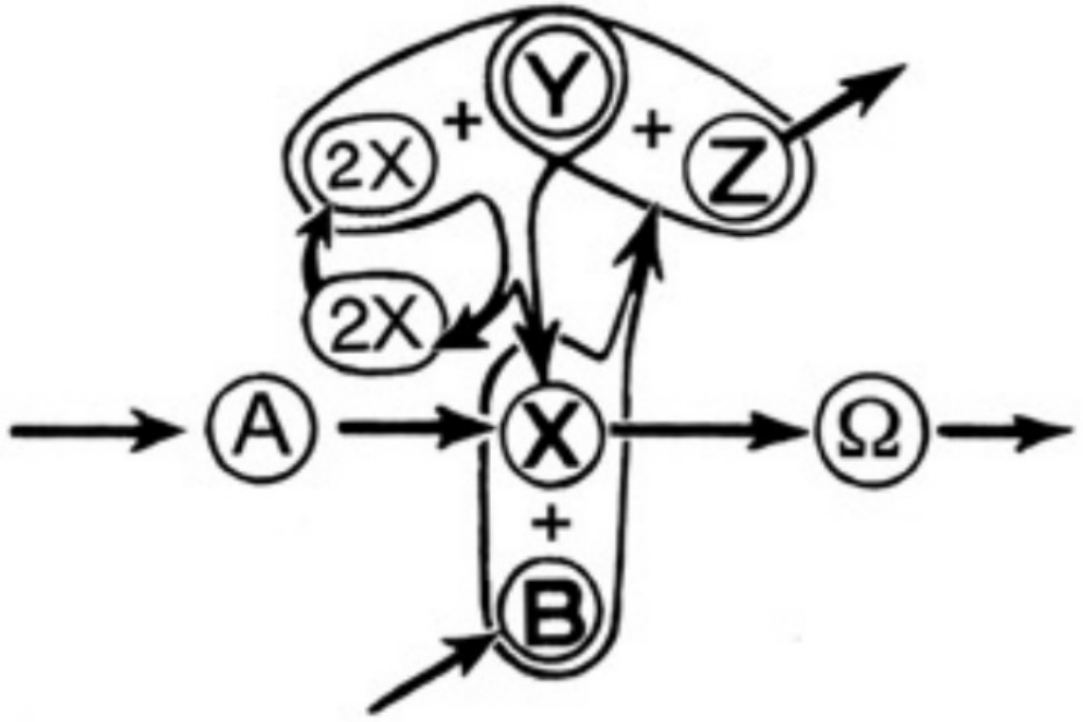


Chemical waves in the Belousov-Zhabotinskii reaction. The reaction has turned red in the darker regions and light blue in the lighter regions.

History of SQK

6. Turing's work became better known in 1967 when a group at Brussels University published a series of theoretical papers on spatial instability in homogeneous chemical systems.
7. → A reaction kinetic model known as the Brusselator (Figure on next slide) → SQK or Model G is a simple extension of this.
8. This two-variable model holds the distinction in the field of reaction-kinetics of being an archetypal reaction-kinetic oscillator, comparable in simplicity to the simple harmonic oscillator of wave mechanics.

History of SQK

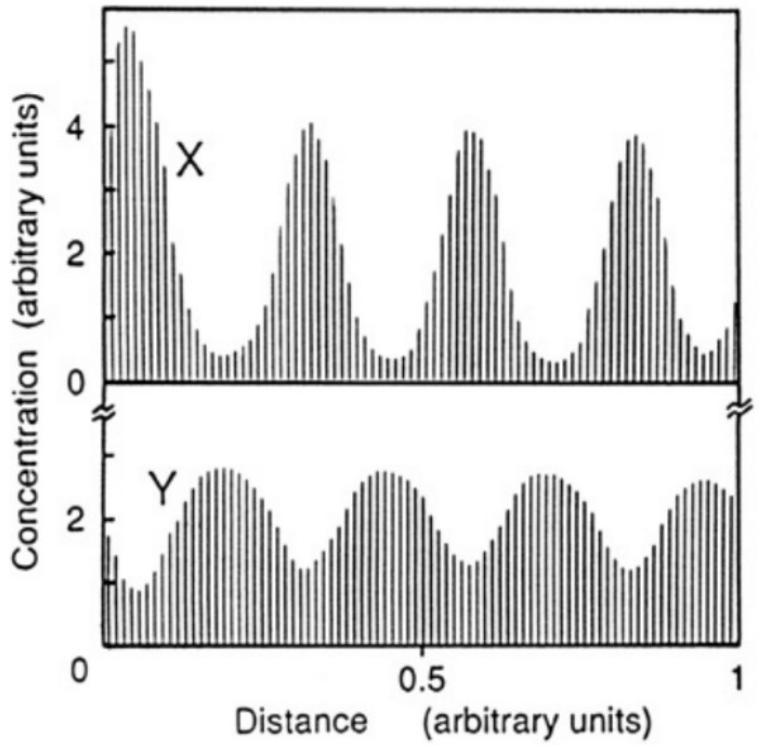


A schematic of the Brusselator reaction pathways.

History of SQK

9. That is, “it is the simplest reaction system known to produce wave patterns that have well-defined wavelength properties”; see Figure on next slide.

History of SQK

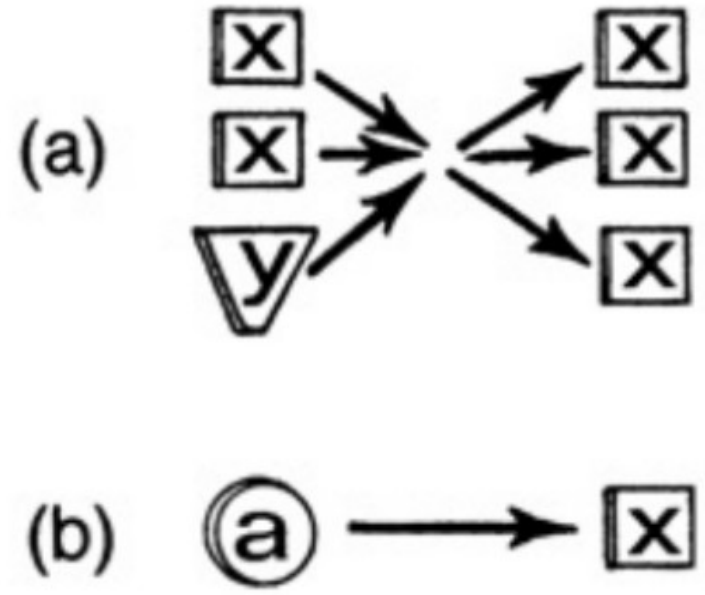


. Computer simulation of a nonlocalized stationary concentration wave generated by the Brusselator reaction in a one-dimensional reaction volume.

Reactive Behaviour of the Ether

As constituents of the ether, etherons play a role which is analogous to that of atoms and molecules in chemical reaction systems, or analogous to neutrons and fissionable atoms in a nuclear reactor. As a result of their random motion, etherons have a certain probability of colliding with one another and subsequently of interacting. If the collision involves the right combination of etheron types, a transformation could occur such that at least one of the etheron's changes from being one species into being another. See Figure on next slide.

Reactive Behaviour of the Ether



Examples of subquantum reactions: a) a multi-etheron interaction, b) a solitary transformation.

Reactive Behaviour of the Ether

Etheron species that serve as inputs to a transformation are called reactants, while species yielded as outputs from a transformation are called products. The terms reactants and products are more often used to refer to the ether substrates, rather than to their etheron constituents since this reaction-kinetic approach usually employs a macroscopic, collective description of these processes.

Ether Kinetics Equations

Etherons react with one another along certain preferred pathways

$$2\,\mathrm{X} + \mathrm{Y} \underset{k_{-3}}{\overset{k_3}{\rightleftharpoons}} 3\,\mathrm{X}$$

For example, the autocatalytic reaction

illustrated in Figure (a), two slides above, is shown here.

Ether Kinetics Equations

$$2\,X + Y \underset{k_{-3}}{\overset{k_3}{\rightleftharpoons}} 3\,X$$

where X and Y represent the concentration values of the X and Y substrates and where k_3 and k_{-3} represent the forward and reverse reaction rate constants, or kinetic constants, for this transformation. Such equations are often called “state equations” because they describe how the constituent elements change from one state or form into another. A set of such equations would be used to specify the ether reactions that produce our physical universe.

Diffusive Behaviour

Besides reactively transforming from one type into another, etherons also move in space. Like molecules in a gas or liquid, etherons exist in a state of random motion continually colliding with one another. Due to their “Brownian motion,” they have a tendency to diffuse from regions of high to low concentration. Just as with molecules, at a given point in space the direction and rate of diffusion of etherons of a given type depends on the direction and steepness of the slope in the prevailing concentration of those etherons. The steeper the concentration gradient, the more rapidly etherons will diffuse down the gradient. This is an example of the Second Law of Thermodynamics at work in nature.

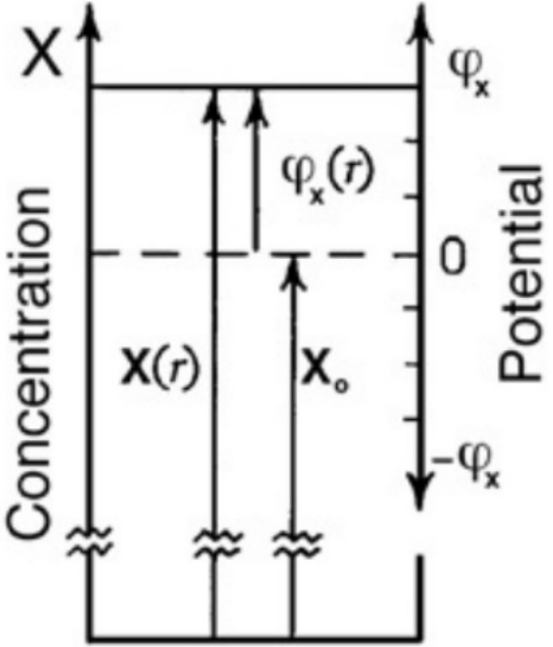
Ether Substrate Fields and Field Potential

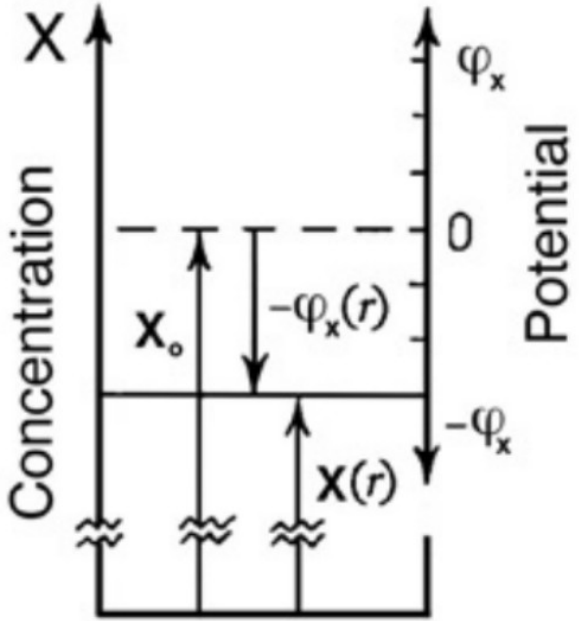
There is a one-to-one correspondence between ether concentration and the concept of field potential used in quantum theory. To clarify this correspondence, we define a quantity called the ether substrate potential φ_i which is the difference between a specie's actual concentration and its homogeneous steady-state concentration, e.g.,

$$\varphi_X(r, t) = X(r, t) - X_0$$

See Figure on next slide.

Ether Substrate Fields and Field Potential





The relation of an ether substrate potential ϕ_X to its corresponding etheron concentration.

Model G - Toward a Unified Field Theory

Contemporary field theory finds its roots in the 18th and 19th century mechanical ether theories. Those theories conceived force fields to be states of stress in an underlying ether substance.

Model G - Toward a Unified Field Theory

While material particles were acknowledged as the sources of fields, there was no theory then available that would explain how particles generated their fields.

Model G - Toward a Unified Field Theory

Particles were assigned attributes such as “mass” and “charge” with no attempt being made to delve further than this.

Model G - Toward a Unified Field Theory

Contributing to this conceptual split between the fields, on the one hand, and the producers of the fields (particles), on the other, was the practice of regarding material particles as being physically isolated from the ether.

Model G - Toward a Unified Field Theory

Thus an inherent dualism became structured into early field theory. Namely, particles were understood as the source of force fields, yet they were at the same time considered to be separate from those fields. Although the ether theory was abandoned at the start of the last century, the force field concept was retained together with the mechanistic framework in which it was couched. Consequently, this “field/ source dualism” became transplanted into contemporary physics.

Model G - Toward a Unified Field Theory

This dualistic framework has proven distasteful to theoreticians seeking to construct unitary descriptions of physical phenomena. For example, this fragmentation of physical theory was noted by Einstein who wrote:

Model G - Toward a Unified Field Theory

Einstein: *In Newtonian physics the elementary theoretical concept on which the theoretical description of material bodies is based is the material point, or particle. Thus matter is considered a priori to be discontinuous... But when, in the second half of the 19th century, the laws of electrodynamics became known, it turned out that these laws could not be satisfactorily incorporated into the Newtonian system. ...The introduction of the field as an elementary concept gave rise to an inconsistency of the theory [of electrodynamics] as a whole. Maxwell's theory, although adequately describing the behavior of electrically charged particles in their interaction with one another, does not explain the behavior of electrical densities, i.e., it does not provide a theory of the particles themselves. They must therefore be treated as mass points on the basis of the old theory [Newtonian physics]. The combination of the idea of a continuous field with that of material points discontinuous in space appears inconsistent.*

Model G - Toward a Unified Field Theory

Einstein believed that the physical reality of space would be best represented by a continuous field and that all physical phenomena, including particles, could be described by the appropriate solutions to the equations representing this field. He spent many years attempting to modify his general relativity theory into a form that might yield such a unified field theory that would embrace gravitating masses as well as electrodynamic interactions, but was unable to attain a workable formulation.

Model G - Toward a Unified Field Theory

As shown here, it may be possible to realize the long sought goal of a unitary field theory by working within the fertile framework of subquantum kinetics (as Model G).

Reaction Scheme of Model G

Model G is a nonequilibrium, nonlinear ether reaction scheme that is specified by the following five kinetic equations which represent ether reactions that take place among various etheron constituents:

Reaction Scheme of Model G

$$\mathrm{A} \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} \mathrm{G}$$

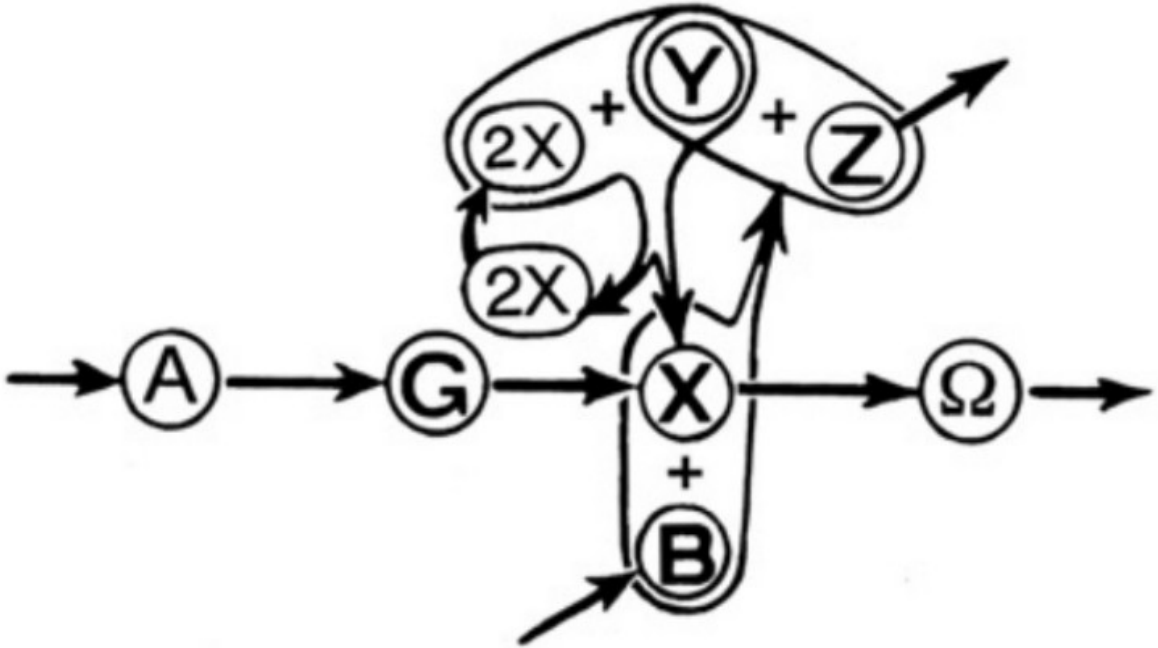
$$\mathrm{G} \underset{k_{-2}}{\overset{k_2}{\rightleftharpoons}} \mathrm{X}$$

$$\mathrm{B} + \mathrm{X} \underset{k_{-3}}{\overset{k_3}{\rightleftharpoons}} \mathrm{Y} + \mathrm{Z}$$

$$2\,\mathrm{X} + \mathrm{Y} \underset{k_{-4}}{\overset{k_4}{\rightleftharpoons}} 3\,\mathrm{X}$$

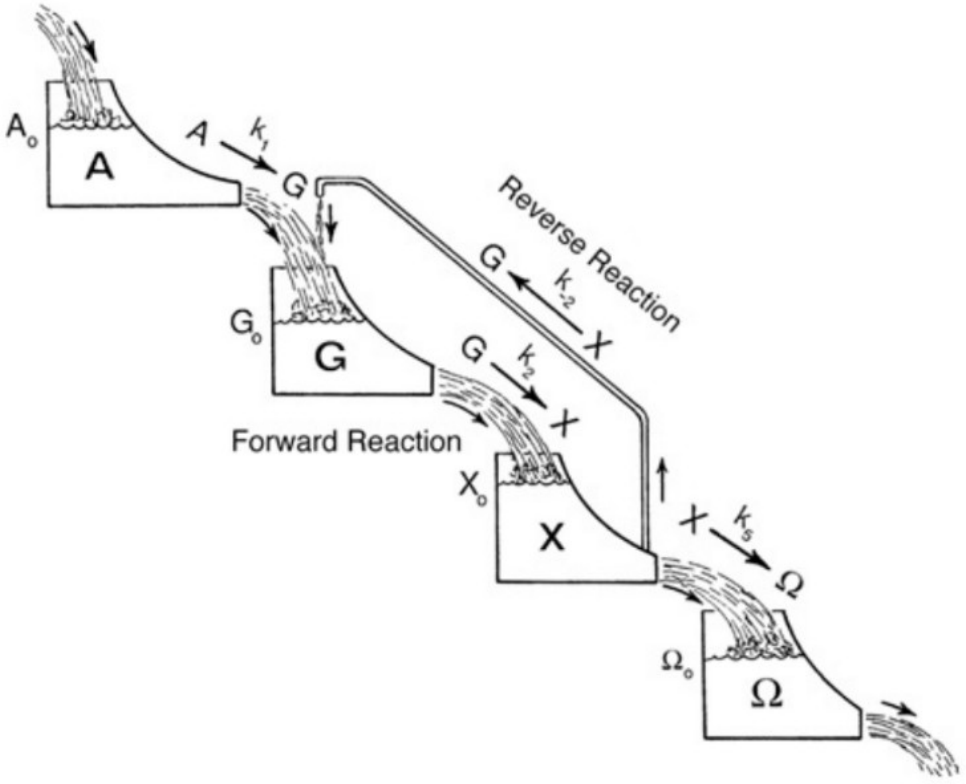
$$\mathrm{X} \underset{k_{-5}}{\overset{k_5}{\rightleftharpoons}} \Omega$$

Reaction Scheme of Model G



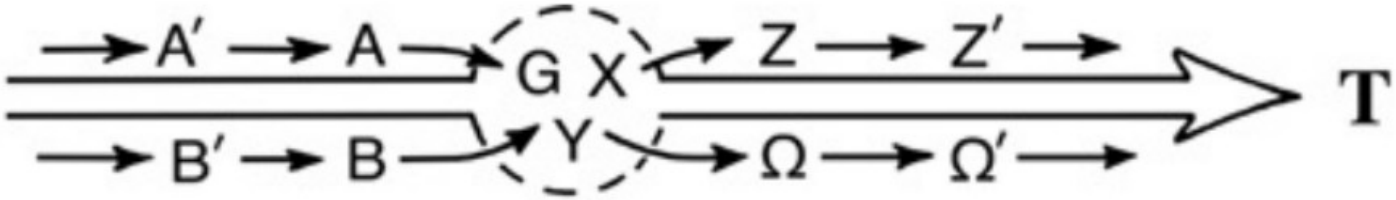
A schematic representation of the reaction kinetics of Model G.

Reaction Scheme of Model G



A hydrodynamic analog of some of Model G's reactions

Reaction Scheme of Model G



A suggested expansion of the Model G ether reaction scheme as it would appear disposed along dimension **T**. G, X and Y mark the domain of the physical universe.

Reaction-Diffusion Equations of Model G

$$\frac{\partial \mathrm{G}(x,y,z,t)}{\partial t} = D_G \nabla^2 \mathrm{G} - (k_{-1} + k_2)\mathrm{G} + k_{-2}\mathrm{X} + k_1 \mathrm{A}$$

$$\frac{\partial \mathrm{X}(x,y,z,t)}{\partial t} = D_X \nabla^2 \mathrm{X} + k_2 \mathrm{G} - (k_{-2} + k_3 \mathrm{B} + k_5)\mathrm{X} + k_{-3}\mathrm{ZY} - k_{-4}\mathrm{X}^3 + k_4 \mathrm{X}^2 \mathrm{Y} + k_{-5}\Omega + \chi$$

$$\frac{\partial \mathrm{Y}(x,y,z,t)}{\partial t} = D_Y \nabla^2 \mathrm{Y} + k_3 \mathrm{BX} - k_{-3}\mathrm{ZY} + k_{-4}\mathrm{X}^3 - k_4 \mathrm{X}^2 \mathrm{Y}$$

$$\chi(r,t) = -e^{\frac{r^2}{2}} e^{\frac{-(t-T)^2}{C}}$$

Reaction-Diffusion Equations of Model G

Two important features give Model G and the Brusselator their ability to spontaneously evolve ordered concentration patterns. These are *autocatalysis*, which gives the system its nonlinear characteristic, and *crosscatalysis*, which gives the system its tendency to oscillate. Model G has only one autocatalytic reaction, Step (3.1d). See following slide.

Reaction-Diffusion Equations of Model G

$$A \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} G$$

$$G \underset{k_{-2}}{\overset{k_2}{\rightleftharpoons}} X$$

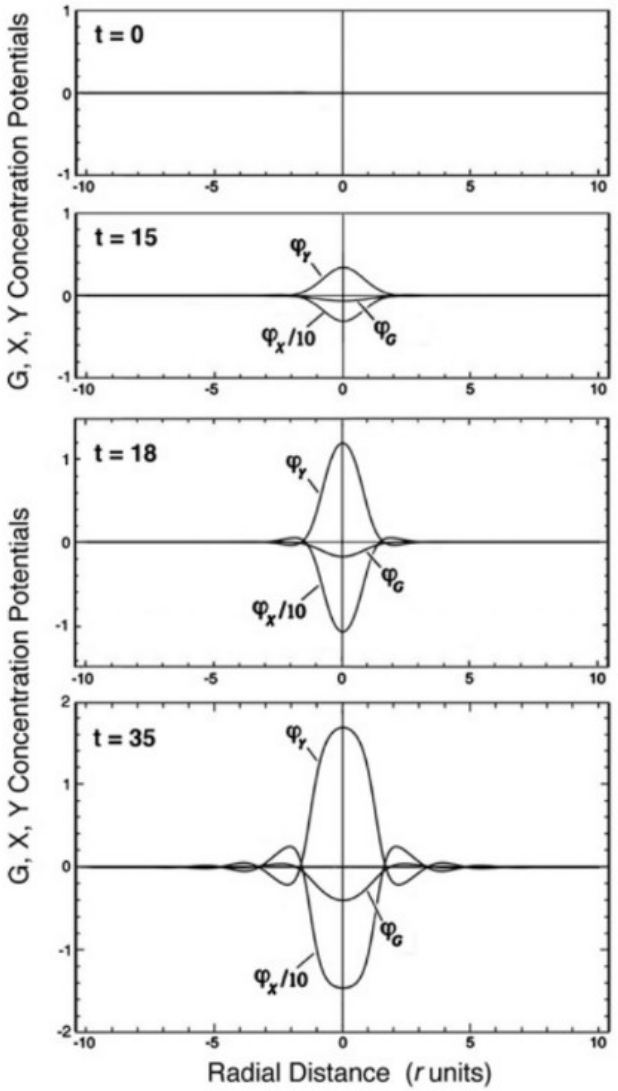
$$B + X \underset{k_{-3}}{\overset{k_3}{\rightleftharpoons}} Y + Z \qquad \text{Step (3.1c)}$$

$$2X + Y \underset{k_{-4}}{\overset{k_4}{\rightleftharpoons}} 3X \qquad \text{Step (3.1d)}$$

$$X \underset{k_{-5}}{\overset{k_5}{\rightleftharpoons}} \Omega$$

Reaction-Diffusion Equations of Model G

As more X is produced as a product on the right side of this equation, more X becomes available as a reactant on the left side to convert Y into X, hence X has the tendency to grow exponentially with time. However, this growth does not proceed unchecked. It is brought back into balance by Reaction Step (3.1c) which converts X back into Y, thereby forming with Step (3.1d) a self-closing reaction loop. The system's ability to generate periodic structures emerges as a result of the interplay between these growth and balance processes.



The simulation that results when these equations are solved in 1 dimension (with 3D symmetry) is shown

Sequential frames from a three-dimensional (3D symmetry in 1D) computer simulation of Model G showing the emergence of an autonomous dissipative soliton particle: t = 0 the initial steady state; t = 15 growth of the positively charged core as the X seed fluctuation fades; t = 18 deployment of the periodic electric field Turing wave pattern; and t = 35 the mature dissipative soliton particle maintaining its own supercritical core G-well. Simulation by M. Pulver.

Concluding Remarks

Since 2018, the Model G Vortical Motion Group has been attempting to progress subquantum kinetics by including vortical motion/rotation into the reaction-diffusion equations in the hope of modeling quantum particle spin.

Concluding Remarks

SQK theorizes that an ether vortex would develop in the particle's core and that this produces what physicists refer to as particle spin magnetic moment. Achieving this would make Model G (i.e. SQK) more physically realistic, thus upgrading it and allowing it to describe science and technologies at quantum level.

Concluding Remarks

At present, physics has no official conceptual model of what spin is, it just assumes it as a property of subatomic particles. SQK goes further to explain the details of how spin forms.

Concluding Remarks

Currently, we are also working to simulate Model G in two and three dimensions. We hope this will eventually allow us to simulate solitons that demonstrate the ability to elastically scatter from other solitons in a way similar to what takes place in the physical world on the subatomic level.

Concluding Remarks

Utilizing the open system paradigm Subquantum Kinetics (SQK) (or Model G) allows us to analyze many propulsion and over-unity energy technologies that cannot be explained by conventional physics. The electro-gravitic technologies which thus far have been explained using the SQK paradigm include: Townsend Brown's electro-gravitic thruster; the Podkletnov gravity impulse beam, and the Searl disc.

Concluding Remarks

It also provides a useful paradigm for understanding how unbalanced electrostatic or magnetic field forces can induce a net propulsive thrust, as in the case of T. T. Brown's asymmetrical capacitor and the Nassikas superconducting thruster.

Concluding Remarks

SQK conceives the electric field potential (ether concentration gradient) and magnetic field (ether vortex currents) as being seated in the ether as opposed to being attached to the field sources that generate them.

Concluding Remarks

SQK provides a framework for understanding the functioning of technologies that can tap into the ether and create energy that is clean and very cheap! It therefore provides a new paradigm for physics, one where over-unity energy generation becomes possible.

END

Thank you for your time!