

Quantum Mechanics and Gravitation versus the Least Action Electromagnetic Equilibrium States that underlie them

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Although the physics community has been aware since Coulomb that kinetic energy is adiabatically induced in electrically charged elementary particles as a function of the inverse square of the distance that separates them, and since the beginning of the 20th century that these particles organize "axially" into atomic structures, to stabilize in resonance states that hinder translational motion, quantum physics still deals with kinetic energy "horizontally", so to speak, as witnessed by the fact that the Hamiltonian, basic to quantum physics, and by the same token, the Lagrangian, are unable to account for the continued presence of the kinetic energy that remains adiabatically induced in electrons, for example, even when they are translationally immobilized into one of the various orbital resonance states revealed by Quantum Mechanics, corresponding to the various least action electromagnetic equilibrium states into which these particles become captive in atoms and that these resonance states stem from.

Mechanics traditionally deals with the relations between force, motion and matter, and from the Hamiltonian and Lagrangian perspective, seemingly deals with this "real kinetic energy" almost as an afterthought, due to the fact that the only parameter determining momentum besides velocity is mass, thus making it appear as though kinetic energy was an emergent quantity that depends on velocity, and not as a pre-existing primordial quantity that can cause velocity when such motion is not hindered by local circumstances.

Indeed, the adiabatic nature of the kinetic energy induced in charged particles seems to rather mandate in reality that velocity, mass, pressure and charge would rather be emergent properties due to the presence of kinetic energy, the latter three properties being linked to the forced inhibition of the translational velocity of kinetic energy, forcing kinetic energy into configurations that induce these properties.

It is precisely the fact that the kinetic energy of a body is considered to fall to zero when this body is translationally immobilized, in the Hamiltonian/Lagrangian traditional conception of momentum, that made it impossible up to now to clearly identify the nature of these three last properties of kinetic energy, because they are linked to the adiabatically maintained presence in the massive particles making up these bodies of quantities of unreleasable kinetic energy not subject to the Principle of conservation of energy, and of which the Hamiltonian and Lagrangian are consequently unable to account for when translational velocity falls to zero, which has prevented its study up to now.

The following paper, published in the Journal of Physical Mathematics in April of 2017, puts in perspective the manner in which a new trispatial space geometry allows establishing a mechanics of elementary electromagnetic particles that integrates all conversion processes that are possible between electromagnetic energy and mass at the

submicroscopic level, as well as the sequence of trispatial LC equations that stems from this space geometry, and clarifies how mass, velocity, pressure and charge can only be emergent properties due to the presence of kinetic energy.

- [Michaud A \(2017\) **The Last Challenge of Modern Physics**. J Phys Math 8: 217. doi: 10.4172/2090-0902.1000217.](#)

- **Le dernier défi de la physique moderne**

This space geometry renders obvious the need to integrate into particle theory an aspect of kinetic energy adiabatically induced that neither the Hamiltonian nor the Lagrangian, relativistic or not, are able to account for, which is its continued presence even when no translational velocity is possible, a then translationally hindered continued presence which is what gives rise to the emergent properties of mass, pressure and charge in the trispatial geometry.

Awareness of the axial interplay between the electric Coulomb attraction between charged particles and the predominantly repulsive magnetic interaction between particles whose energy electromagnetically oscillates at different frequencies, combined with the axial adiabatic variation of charged particles' carrying kinetic energy levels, allows identifying these factors as the cause of these states and explain the shape and amplitude of the various resonance volumes.

In fact, Quantum Mechanics' wave function describes the shapes of the volumes occupied by the statistical spread of the positions that the electron can possibly occupy in the various orbital configurations as a function of the local circumstances, while the least action electromagnetic equilibrium mechanics explains the existence of these volumes and their elaboration as a function of time.

Renewed awareness of the mass variation effect due to the presence of this adiabatically stabilized induced energy in atomic and nuclear structures as a function of the local intensity of the gravitational gradient also sheds an entirely new light on gravitation, because it can be demonstrated that the least action electromagnetic equilibrium states in atomic and nuclear structures that determine these energy levels also determine the local intensity of the gravitational gradient on top of determining the orbital resonance states revealed by Quantum Mechanics, thus unifying QM and gravitation.

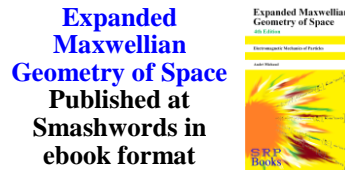
Some aspects of the model require clear understanding of the relation between the initial and irreversible adiabatic acceleration phase of newly created massive particles and the Principle of conservation of energy, and of the factors that must be taken into account to calculate the least action electromagnetic equilibrium states that determine the resonance states revealed by Quantum Mechanics. An analysis of these aspects of particle physics is carried out in the following paper:

- [On Adiabatic Processes at the Elementary Particle level](#)
(2016) J Phys Math 7: 177. doi:10.4172/2090-0902.1000177

First described in a popularization work in 1999 [2], a summary overview of this new space geometry was formally presented at CONGRESS-2000, "*Fundamental Problems of*

Natural Sciences" [3], St. Petersburg State University, St. Petersburg, Russia on July 5 of 2000.

The complete fundamental model based on this expanded space geometry with appropriate mathematical support was then the object of a popularization book constantly updated and made available in 2004 [4].



Most aspects of the model were then progressively published in various journals and made available over the Internet as a series of separate papers listed further on.

Upon invitation from the editors of Scholars' Press after publication of the article on adiabatic processes, the complete model was then published as a monograph at *Scholars' Press* to be made available in the academic community [6]:

**Electromagnetic Mechanics
of Elementary Particles**
published at
Scholars' Press



The seminal considerations that gave rise to the 3-spaces model and its fundamental space geometry are detailed in the following paper, which was accepted by the reviewers and editors of the Journal of Physical mathematics as conforming to Maxwell's equations and was published in the 2016 issue No. 7 of the Journal:

- On de Broglie's Double-Particle Photon Hypothesis

(2016) J Phys Math 7: 153. DOI:10.4172/2090-0902.1000153

- **À propos de l'hypothèse du photon à double corpuscule de Louis de Broglie**
- **Sobre la hipótesis de Louis de Broglie respecto al fotón a partícula doble**
- **Über die Hypothese des Doppelpartikelphotons von Louis de Broglie**

Model Dependant papers

Series of model dependant papers describing a seamless series of clearly defined interaction sequences providing an uninterrupted path of causality from:

- 1) the quantities of unidirectional (that is, translational) kinetic energy that sustain the momentum of charged and massive elementary electromagnetic particles and of their electromagnetic complement that are adiabatically induced in them Coulomb acceleration,
- 2) to the release as a free-moving electromagnetic photon of any quantity of this energy that becomes in excess of the precise amount allowed by some stable or metastable electromagnetic equilibrium state, for example, when an electron becomes captive of the resonance state of an atom's available orbital

after having accumulated this energy now in excess while accelerating to reach this equilibrium state,

- 3) to the creation of electron-positron pairs from the destabilization of electromagnetic photons of energy 1.022 MeV or more,
- 4) to the creation of protons and neutrons from the interaction of thermal electrons and positrons forced into groups of three involving both types, in sufficiently small volumes of space, with insufficient energy to escape mutual capture,
- 5) to the final shedding in the form of neutrino energy of momentary metastable excess mass (different from velocity related momentary relativistic mass increment) as overexcited newly created massive elementary particles are forced by local electromagnetic equilibrium states to reach their lowest possible and henceforth stable and invariant rest mass.

Note that the following series of papers should be read in sequence for the uninterrupted causality link between state 1) and state 5) to become totally clear.

Steps 1) and 2), while not being model dependant, nevertheless belong to the same interaction sequence and are described in **Sections 3** and **4** of the following paper:

1) + 2) The Corona Effect

[International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 11 \(July 2013\), PP. 01-09](#)

Before proceeding to the analysis of steps **3)**, **4)** and **5)**, it would be important to clearly understand the internal cyclic motion of the energy making up localized photons, motion that arises from Louis de Broglie's hypothesis on the double-particle photon being applied to the 3-spaces model. This motion, which was already described in the seminal paper previously mentioned, is integrated in a more detailed manner into the causality sequence in the following article:

Expanded Maxwellian Geometry of Space Geometry and the Photon Fundamental LC Equation

[International Journal of Engineering Research and Development, e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 6, Issue 8 \(April 2013\), PP. 31-45.](#)

- La géométrie maxwellienne augmentée de l'espace et l'équation LC fondamentale du photon

3) The Mechanics of Electron-Positron Pairs Creation in the 3-Spaces Model

[International Journal of Engineering Research and Development, e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 6, Issue 10 \(April 2013\), PP. 36-49.](#)

4) The Mechanics of Neutron and Proton Creation in the 3-Spaces Model

[International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN : 2278-800X. Volume 7, Issue 9 \(July 2013\), PP.29-53.](#)

5) The Mechanics of Neutrinos Creation in the 3-Spaces Model

[International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 7 \(June 2013\), PP.01-08](#)

Other papers – Not model dependant

Although not model dependant, the following papers account for all observed phenomena in light of the conclusions imposed by the 3-spaces model. They can be read in any order.

1- Field Equations for Localized Individual Photons and Relativistic Field Equations for Localized Moving Massive Particles,

International IFNA-ANS Journal, No. 2 (28), Vol. 13, 2007, p. 123-140, Kazan State University, Kazan, Russia.

- Уравнения поля для локализованных фотонов и релятивистских уравнений поля для локализованных движущихся массивных частиц

- Also available: **Extended abstract** from the Kazan SU site.

- Équations de champs pour photons localisés et pour particules massives en mouvement.

- Ecuaciones de campos para fotones localizados y ecuaciones relativistas de campos para partículas masivas en movimiento

- Feldgleichungen für lokalisierte Photonen und relativistische Feldgleichungen für bewegende lokalisierte massive Teilchen

2- From Classical to Relativistic Mechanics via Maxwell

International Journal of Engineering Research and Development, e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 6, Issue 4 (March 2013), PP. 01-10.

- De la mécanique classique à la mécanique relativiste via Maxwell

- De la mecánica clásica a la mecánica relativista vía Maxwell

- Von der klassischen Mechanik zur relativistischen Mechanik via Maxwell

3- Unifying all Classical Force Equations

International Journal of Engineering Research and Development, e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 6, Issue 6 (March 2013), PP. 27-34

- Unification des équations de force classiques

- Unificación de las ecuaciones de fuerza clásicas

- Vereinheitlichung aller klassischen Kraftgleichungen

4- Deriving ϵ_0 and μ_0 from First Principles

International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 4 (May 2013), PP. 32-39.

5- On the Einstein-de Haas and Barnett Effects

International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 6, Issue 12 (May 2013), PP. 07-11.

6- On the Electron Magnetic Moment Anomaly

International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 3 (May 2013), PP. 21-25.

7- Proposal of an invariant mass reference for the kilogram

- Proposition pour une référence de masse invariante pour le kilogramme

The General Science Journal 2011

8- The Corona Effect

International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 11 (July 2013), PP. 01-09.

9- Inside Planets and Stars Masses

International Journal of Engineering Research and Development. e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 8, Issue 1 (July 2013), PP. 10-33.

- L'intérieur des masses planétaires et stellaires

10- On the Magnetostatic Inverse Cube Law and Magnetic Monopoles

International Journal of Engineering Research and Development e-ISSN: 2278-067X, p-ISSN: 2278-800X. Volume 7, Issue 5 (June 2013), PP.50-66.

11- The Birth of the Universe and the Time Dimension

American Journal of Modern Physics. Special
Issue: Insufficiency of Big Bang Cosmology. Vol. 5, No. 4-1, 2016, pp. 44-52.
doi: 10.11648/j.ajmp.s.2016050401.17

References

- [1] A. Einstein, E. Schrödinger, W. Pauli, L. Rosenfeld, M. Born, I. & F. Joliot-Curie, W. Heisenberg, H. Yukawa, et al. **Louis de Broglie, physicien et penseur**. A Tribute to Louis de Broglie for his 60th birthday, each colleague providing one chapter, Einstein even collaborating to 2 distinct chapters, the complete text drafting a detailed overview of the state of knowledge in fundamental physics in 1952. Éditions Albin Michel, Paris, 1953.
- [2] Michaud A (1999). **Theory of Discrete Attractors**, Canada, SRP Books, 1999.
- [3] **Proceedings of Congress-2000 – Fundamental Problems of Natural Sciences and Engineering**. (2000) Volume 1, St.Petersburg, Russia, pages 291-310.
- [4] Michaud A (2004). **Expanded Maxwellian Geometry of Space**. 4th Edition, SRP Books.
- [5] De Broglie L (1993) **La physique nouvelle et les quanta**, Flammarion, France 1937, 2nd Edition 1993, with new 1973 Preface by Louis de Broglie. ISBN: 2-08-081170-3.
- [6] Michaud A. (2016). **Electromagnetic Mechanics of Elementary Particles**. Scholar's Press. ISBN 978-3-659-84420-1