Unit at the Planck units

Francis Maleval - France
fmaleval@free.fr
26-2-2019

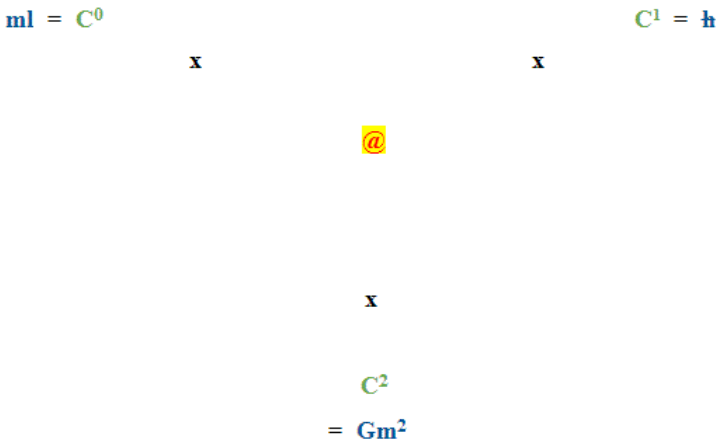
Abstract

Planck units are defined from fundamental physical constants (we exclude in this study the physico-chemical Boltzmann constant). If we put the charge, not originally defined by Planck (1), at the center of this system, this interaction sits on a limit as would be a mathematical structure taking form on the surface of a mirror concept][reality, QM][GR. The coupling constant alpha, intrinsic to the charge, behaves like a metonymy of a part for the whole and, as a causet (2), generates on space-time an interlacing of dimensioned constants, iterated under a geometric sequence.
"A very simple structure is not incompatible with the inexhaustible character of the information contained as well in physics as in mathematics". A.Connes (3)

Introduction :
* Christian J.Bordé, academician, writes about the fine structure constant alpha : "The whole of electromagnetism should be described by means of this constant alone, without the help of any additional base unit, or any other fundamental constant ... such as the electron charge. This point can be discussed in more concrete terms by means of Dirac and Maxwell's equations". (4)
* Pierre Fayet, academician, notes : "The charge of the electron is a quantity both measured and dimensionless ... the coulomb, unit of electric charge, is a unit derived from the mechanical and even geometric units ... while of course also being dimensionless". (5)

With q the Planck charge (1), let's put @=f(α), avatar of $q^2/10^7$ which is function of the ratio α according to C.J.Bordé. Thus @ is a quantum of interaction ; it is an in-form-ation which emerges in dimension on the two characteristics of the vacuum implicitly related to π, the unit $\varepsilon_0\mu_0c^2$. If we give to @ the same numerical value as $q^2/10^7$, ie **3.51767263×10^{-43}** (a), it's equivalent to that
of the quantum ml/c^0 (at rest), ie $2.176470\times10^{-8}\times1.616229\times10^{-35}$ = **3.51767393×10^{-43}** (b)
of the quantum $\hbar/c^1$, ie $1.054571800\times10^{-34}/2.99792458\times10^{8}$ = **3.51767288×10^{-43}** (c)
of the quantum Gm^2/c^2, ie $6.67408\times10^{-11}(2.176470\times10^{-8})^2/(2.99792458\times10^{8})^2$=**$3.51767225\times10^{-43}$** (d)

The information @,
avatar of the duo q^2,
defines the geometric sequence
$c^0@ = ml$ $c^1@ = \hbar$ $c^2@ = Gm^2$



Results :

- The coupling constant intrinsic to the information @ is in the center of this knot, according to slogan of R.Sorkin : order + number = geometry (2). Let's add that α is “the ratio of the velocity of the electron in the first circular orbit of the relativistic Bohr atom to the speed of light in the vacuum" (6). Then we have one-all.
- The universe favors the economy of means such as symmetry (7). If this interlacing was an equivalence relation satisfying Noether's theorem (8), if it was a Borromean mathematical knot, the nature of its elements would be similar.
- To say that the mass deforms the space-time which is energy (ἐνέργεια, force in action), would be to say that the mass is deformation of space-time.
- On the diagram emerge of quanta ; hence Gm^2 would be a quantum.
- From metaphor into metonymy, from the stage of the mirror q²][ml to the identity, there is slippage of the referent (movement), of the signifiers c^0@, c^1@, c^2@ in an exponential evolution and of the signifieds : particle, action, gravitation.

References :

(1) Planck units https://en.wikipedia.org/wiki/Planck_units
(2) Rafael D. Sorkin “Geometry from order: causal sets” http://www.einstein-online.info/spotlights/causal_sets/index.html@searchterm=None.html
(3) Alain Connes “La réalité mathématique archaïque” https://groups.google.com/d/msg/fr.sci.maths/WSHhu4vGXBQ/RSn3r28dquEJ
(4) Christian J. Bordé “Base units of the SI, fundamental constants and modern quantum physics” http://alainconnes.org/docs/bordeunits.pdf - page 2185
(5) Pierre Fayet “À propos des unités fondamentales, notamment des unités électriques” http://www.metrodiff.org/docs/rapport_groupe_de_travail_dec07-1.pdf - Annex 6 p. 24 to 27
(6) Fine-structure constant https://en.wikipedia.org/wiki/Fine-structure_constant
(7) Mirror symmetry (string theory) https://en.wikipedia.org/wiki/Mirror_symmetry_(string_theory)
(8) Noether's theorem https://en.wikipedia.org/wiki/Noether%27s_theorem

Extensions under construction :

https://sites.google.com/site/cotecouretcotejardin/physique