# Holographic two-step gravito-electromagnetic interaction and Dark Matter

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*Abstract. It is shown how misleading is the Einstein propagating photon, while the gravitation - electricity symmetry is patent in the holographic two-step interaction scheme. in accordance with Coherent Cosmology and Eddington's Large Number prediction for the number of atoms in the Universe ($136 \times 2^{256}$). A simple natural interpretation for dark matter follows, as well as a graviton mass.*

The wave-particle dualism has never been correctly presented nor elucidated. The origin of this conandrum is Einstein's paper on a 'propagating' photon. A Nobel prize has been attributed to this, instead of the relativity papers, because it was known that Einstein was not the real discoverer of neither special relativity (attributed to Poincaré by Lorentz, and, later, by Whittaker) nor the generalized one. According to Leveugle [1], Hilbert published the correct equations 5 days before Einstein, several months after having sent a letter to Einstein, containing the solution of the Grossman's formulation of the problem. But the crucial part of the printer's proof in Hilbert's paper has been cut off by someone [1], and Hilbert was accused of plagiarism !

The obvious reason why Hilbert did not seriously claim priority is that he was himself at the origin of the spoliation of the *French* physicist Poincaré for the profit of a *German* one, in the war atmosphere of the time. According to Leveugle [1], Hilbert asked Einstein (who was was suspected by Planck to be a plagiarist of Gibbs' thermodynamics) to sign the famous 1905 relativity paper. Indeed, this text contains the word 'group structure', a term only specialized mathematician, as Hilbert, would know. Note that, with this obvious necessity of a 'group structure', the postulate of '$c$' speed invariance is useless [2]. Moreover, the famous $E = mc^2$ paper of this artificial 'genious', was, in reality [3], a demonstration of $0 = 0$. Einstein himself recognized in a second paper on the subject (may 1906) that Poincaré has demontrated $E = mc^2$, as soon as 1900, in its full generality. The strange inactivity of the french colleagues of Poincaré is explained by the rivality between the dominant Ecole Normale (Paul Langevin) and Ecole Polytechnique (Henri Poincaré).

The harm caused by this 'propagating' photon and the Einstein's prestige cannot be overated. This led to a general state of confusion. For instance, in the paper on the stimulated emission, Einstein did not precise that this is a *coherent* amplification, so missed the laser discovery, and Feynman insisted that one *cannot* understand quantum physics.

De Broglie extended the light wave-particle symmetry to matter, proposing that particles could propagate by wave, and *this* was correct [4]. To resume : 'everything propagate by waves' but for matter, it was not recognized that this means a disintegration-reintegration process, including a matter-antimatter oscillation [4]. Such a misconception of a propagative photon led De Broglie to the vain research of a 'double solution', and Einstein to propose that hidden *local* variables exist, which was, *of course*, refuted by experiment. Some consider this is a triumph for Bohr viewpoint, but his assertion 'quantum physics is complete', is itself reductionism nonsense, because it does not include *the cosmos, the obvious source of hidden variables*, in an holistic approach [4].

Arthur Haas has proposed the first correct formula for the atomic diameter, 3 years before Bohr, simply by adding the Planck formula $E = hf$ to the virial theorem in the simplest atomic model [4], while the subject of Einstein thesis was precisely to determine atomic dimension !

Another badly consequence of a 'propagating photon' is that, by confirming the false concept of a 'light ray', it retarded the discovery of a decisive property of coherent waves : holography (Gabor, 1948). Indeed, simple $c$-free holographic analysis leads to a Grandcosmos of radius $R_{GC}$, equal to C/c times the radius of the observable Universe with $C = cP^3pH/a^6$, with $P, p, H$ the Planck, proton and Hydrogen masses by respect to the electron one and $a = 137.036$, the inverse of the fine-structure constant. An outstanding correlation involves the Grandcosmos volume, with unity the

bare Bohr radius $r_0$ [4]:

$$(4\pi/3)(R_{GC}/r_0)^3 \approx a^a/\pi \tag{1}$$

This 'Determinant Formula' proves that *a* is a *calculation basis* in a Computing Grandcosmos.

Replacing this 'propagating photon' by a *two-step interaction* [4][5], this would involve tachyonic waves, including a gravitational speed $C_G \gg c$ (according to Van Flandern [6], the stability of planet orbits implies $C_G > 10^{10}\ c)$. The emitter-receptor symmetry implies that a *divergent* spheric wave from a source *S* must be transformed in a *convergent* wave towards a *specific* receptor *R*. The holographic formalism [4] (which is precisely a *two-step* one) applies directly: the *f* - frequency source *S* is associated with a stationary unitary wave $s + s^*$, with $s = e^{i2\pi f(t-r/c)}$, or $e^{i2\pi F(t-r/C)}$, with the Gabor holographic condition $C_G/c = F_G/f$, so $ss^* = 1$, while potential $f$ - $F_G$ - receptors corresponds to $\Sigma(r + r^*)$. A gravitational hologram is formed in the vacuum (which so must be *not* empty) ; $(s + s^*)\Sigma(r + r^*)$, which includes the *resonant* term $\Sigma(sr^* + s^*r)$. So, an excess of the wave $s + s^*$ produces the term $(s + s^*)\Sigma(sr^* + s^*r)$ implying an excess of the waves $\Sigma(r + r^*)$, permitting a quantum *cosmic calculation, due the large value of $C_G$*, can determine which precise receptor will get *all* the photon energy, a scheme which maintains the information *'all the excess energy is concentrated in an unique atom'*. This means atoms are in a state of optimal communication : it is why all Hydrogen atoms have strictly the same mass.

Now, consider a *galilean* steady-state cosmology, with the speed of galaxy recession *strictly* proportional to distance, in an Universe of invariant radius *R* and invariant mass *M*. Note that in the standard cosmology *R* is variable, so cannot be tied to any holographic conservation. The classical gravitational potential energy is $-(3/5)GM^2/R$. Now, by integrating the galactic kinetic energy $(dm)v^2/2$ in the *R*-radius sphere, one obtains the non-relativistic result $(3/10)Mc^2$. By equalizing these energies, this corresponds to the 'critical condition' $R/2 = cT/2 = GM/c^2$, *without any appeal to the ad-hoc 'inflation'*, introduced by standard cosmology. and corresponding to an Euclidean geometry, after involving General Relativity !

The separation of the total Universe energy $Mc^2$ between its 3/10 and 7/10 parts is so clearly demonstrated, but is an unsolvable enigma for current cosmology based on General Relativity, a *local* theory applied to cosmology, a method Poincaré has forbidden, arguing that in a unique Univers, differential equations would imply free parameters [4].

It is recalled that the Eddington's prediction [7] for the number of equivalent Hydrogen mass in the Universe is $136 \times 2^{256}$, a prediction which was largely mocked, but which is consistent with the official concordance value $T = 13.80(5)$ Gly, taking account of the above 3/10 relative density for matter: this writes:

$$M_{mat}/m_H = (3/10)Tc^3/2Gm_H \approx 2^{256} \times 136.2(5) \tag{2}$$

probably the most remarkable scientific prediction in History. *So, the dark matter would be in fact ordinary matter, but as these two kinds of matter are not photon-interacting, this means they are vibrating in quadrature.* So the solutions of the Dark matter and antimatter problems are directly connected.

The length $R/2 = GM/c^2$ is given by the dimensional analysis excluding $\hbar$. But, since tachyonic speeds are necessary to connect a so vast Universe, one must look for a value of *R/2* independant of *c*. Such a *c*-free distance is given by the formula $\hbar^2/Gm^3$, so the simplest choice is:

$$R/2 = \hbar^2/Gm_p m_n m_e \tag{3}$$

respecting the symmetry between electron, proton and neutron, the three main particles of Atomic Physics, and compatible with *c* times the so-called 'Universe age' 13.80(4) Gyr. This formula was found in 3 minutes of cosmology reapraisal (september 1997), and associated with holographic conservation and gravitation-electricity symmetry, but was censored by the French Academy, under

the fallacious pretext that 'Primordial Big Bang is proved'.

The above term $Gm_pm_H$ appears in the gravitational force between a proton and an Hydrogen atom, by far the more numerous atom in the Universe. By comparing with the elementary electric force $e^2/r^2$, that means a symmetry $m_pm_H \leftrightarrow e^2$, corresponding to the formula $\hbar^2/e^2m_e = r_0$, the bare Bohr radius [4]. *This shows how the holistic approach is far much efficient than the reductionist one*.

Applying the same symmetry to the critical formula, one gets the length *(R/2)(R/r₀)*. Assuming a common frequency $c/r_0 = C_G/R$ is at work, this implies :

$$C_G/c = R/r_0 \approx 2.47 \times 10^{36} \qquad (4)$$

With the above holographic 'Gabor condition', $C_G/c = F_G/f = m_GC^2/m_ec^2$ this means $C_G/c = m_e/m_G$, so the graviton mass would be:

$$m_G = m_er_0/R \approx 3.69 \times 10^{-67} \text{ kg} \qquad (5)$$

By comparing with the Marchal photon mass [7] $m_{ph} = \hbar/c^2t_{cc} \approx 1.22 \times 10^{-55}$ kg, tied to the non-Doppler Coherent period [4] $t_{cc} \approx 9600.61$ s, one observes, to 1%, a *direct* connexion with the electroweak interaction coefficient $a_{ew} = \hbar^3/G_Fcm_e^2$, where $G_F \approx 1.435851 \times 10^{-62}$ Joule $m^3$ is the Fermi constant :

$$m_G/m_{ph} \approx a_{ew} \qquad (6)$$

Moreover, $C_G$ connects directly with the superspeed $C$ and the characteristic term $a^a$:

$$C^9/C_G^7c^2 \approx a^{a+exp(-2\pi)} \qquad (7)$$

It is concluded that holographic two-steps gravito-electromagnetism interaction and Coherent Cosmology are mutually consistent.

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