Light is the ingredient of the particles of spin 1/2 (= h/4π).

By Antonis N. Agathangelidis
Trapezountos 22, Oreocastro Thessaloniki 57013,
E-mail: anagath1943@gmail.com

An introductory question. We know that one ordinary neutral atom is transformed into a negative or positive ion when it respectively drags some of the external electrons or loses some of its own ones. In all cases the neutral atom and the negative or positive ions differ in their masses i.e their charge / mass ratios differ measurably. But in the Text-Books on particle physics [1] we read about the electron and positron of the same-identical "electron-rest-masses" of 0.511006 MeV and presumably carrying the charges ± 1 ;{Greater but identical masses are appearing for "μ^+ and μ^- muon –rest- masses" of 105.7 MeV and finally the "proton and antiproton –rest-masses" are appearing equal to 938.3 MeV, while their charges are again ± 1}. The above equality of the masses of all the mentioned pairs of "particles and antiparticles" means that the "bulk of mass goes properly to the created particle" while the "masses of the positive or the negative charge-ingredients" seems to be entirely negligible; for that it creates large mistakes the use of the just following equation (regarding to determine the "Classical radius" of the spherical electron):

$$\frac{e^2}{R_{CL(e)}} = m_e C^2 \quad \text{and} \quad R_{CL(e)} = \frac{e^2}{m_e C^2} = 2.81777 \times 10^{-13} \text{ cm}$$

A similar equation could offer for the "Classical radius" of the spherical proton:

$$R_{CL(p)} = \frac{e^2}{m_p C^2} = \ 1.53473 \times \ 10^{-16} \quad (!)\text{cm.}$$

If the last result appears to be very strange it means that we have to change our theoretical method for calculation of the "classical radius" of electron and of proton.

Energy of spinning electron. The electron has a mechanical spin J=$\pm$h/4π thus it shows two projections (parallel and anti-parallel) in an external magnetic field; similarly two interacting electrons can have their spins in parallel or in anti-parallel orientation too.

{In books on Q/M some of the authors [2] try to use the curious rule:

"*that the absolute magnitude of electron spin* $\left(\frac{h}{4\pi}\right)$ *must be calculated as* $\sqrt{3}\left(\frac{h}{4\pi}\right)$"

This apparently erroneous rule is "proved" by a very arbitrary way because the J_z =$\pm$h/4π is obtained by the presence of a magnetic field along z-axis <u>only</u> and thus the J_x and J_y have no field along them; thus the J_x and J_y are not equivalent to J_z; thus:

$\sqrt{\mathbf{J} * \mathbf{J}} \neq\neq \sqrt{3 < J_z^2 > \text{av}}$ }

We will accept the magnitude of the electron spin $J = \dfrac{h}{4\pi}$

Accepting the mechanical spin *h/4π* we can speak about an "internal" energy of the electron; this "internal" energy of the electron, -due to its spin-, can be appearing as an "external" rest mass m_o of the electron (-in Earth's LAB with present the resting ether-). Thus for a model of electron where its "internal" rest mass μ_o is distributed along a thin circular ring –of radius R- rotating with an angular speed ω, we can write the equation:

$$\frac{\mu_{o,(in)}C^2}{\sqrt{1-\left(\frac{\omega R}{C}\right)^2}} = m_{o,(ext)}C^2 \qquad (1)$$

On the other hand ([5]) the angular momentum of the thin-circular-ring electron is the following

$$J \equiv \frac{\mu_{o,(in)}}{\sqrt{1-\frac{(\omega R)^2}{C^2}}} \ \omega R \ \ R = \frac{h}{4\pi} \qquad (2)$$

Eliminating the $\mu_{o,(in)}$ between the relations (1) and (2) we get

$$m_o = \left(\frac{h}{4\pi}\right)\frac{1}{\omega R^2} \qquad (3)$$

Symmetric - annihilations. In our e^- - e^+ annihilation experiments in Earth's LAB (and with the center of mass at rest in Earth's LAB and into the resting ether [5]) we see two identical γ-photons emerging in opposite directions; this can be explained simply as follows: "Each one electron (or positron) contains a photon captured into a circular propagation around a charge". But from our work [3] we have proved that each one photon has an extension equal to λ/2 and then the radius R of the discussed ring of the electron (or of positron) must be given by

$$2\pi R=\lambda/2 \qquad (4).$$

Let us now calculate the "angular momentum of the circulating photon":
= linear momentum of photon $\frac{h\nu}{C}(=\frac{h}{\lambda}) \times R(=\frac{\lambda/2}{2\pi}) = (\frac{h}{4\pi})$ i.e., we have found the mechanical spin of electron or of proton.

Now we will express the mass m_o of the electron as function of the assumed radius R of the electron:

$$m_o = \frac{h}{c\lambda} = \frac{h}{c\ 4\pi R} \qquad (5)$$

Now substituting mass m_o from (5) into (3) we get finally the relation: (ωR) = c, which simply verify the correctness of our assumption about the encircling photon into the electron.

From "Compton wavelength of the electron" and from relation (4) we can obtain finally a radius of the electron:

$$R_e = \frac{1}{4\pi} \frac{\mathrm{h}}{m_{(o.e)}\ C} = 1.93072 \times 10^{-11} \qquad \text{cm}$$

If we thing in a similar manner for proton (and antiproton) and their possible (theoretical) symmetric annihilations into two γ-photons we can propose, with the use of the above theory and relations, the radius of the proton:

$$R_p = \frac{1}{4\pi} \frac{h}{m_{(o.p)}\ C} = 1.05159 \times 10^{-14} \qquad \text{cm}$$

Spin conservation in motion. According to our theory, the electron (or positron) contains a photon $\{$of extension $\frac{\lambda_{Compton}}{2}\}$, which has been captured -around a charge- propagating along a circular ring. Now we will consider the linear motion of the electron through the ether (the electron is an open frame in ether).
Let us consider the acceleration of an electron into one circular accelerator. The level of this page is assumed to coincide with the level of the circular accelerator and as a magnetic field always is normal to the level of accelerator we thus can consider the 'the ring of the electron' also coinciding with the level of this page.
As the electron ring moves in ether each elementary arc of the ring is subjected to local mini-Doppler-effects (Fig. 1):

$$\nu_{(\theta,\upsilon)} = \frac{\nu_o}{1-\frac{\upsilon}{C}\cos\theta} \quad (6) \qquad \text{and} \qquad \lambda_{(\theta,\upsilon)} = \lambda_o\left(1-\frac{\upsilon}{C}\cos\theta\right) \quad (7)$$

As now the frequency of (6) participate into the "local momentum" (hv/c) of circulating photon while the wavelength of (7) multiply the "radius-arm" to calculate the "angular momentum of the photon"; finally these Doppler effects cancel each other and the total "angular momentum" of the linearly moving electron remains constant.

The increase of mass in motion. Let us consider the acceleration of an electron into one circular accelerator. The level of this page is assumed to coincide with the level of the circular accelerator and as a magnetic field always is normal to the level of accelerator we thus can consider the 'the ring of the electron' also coinciding with the level of this page.

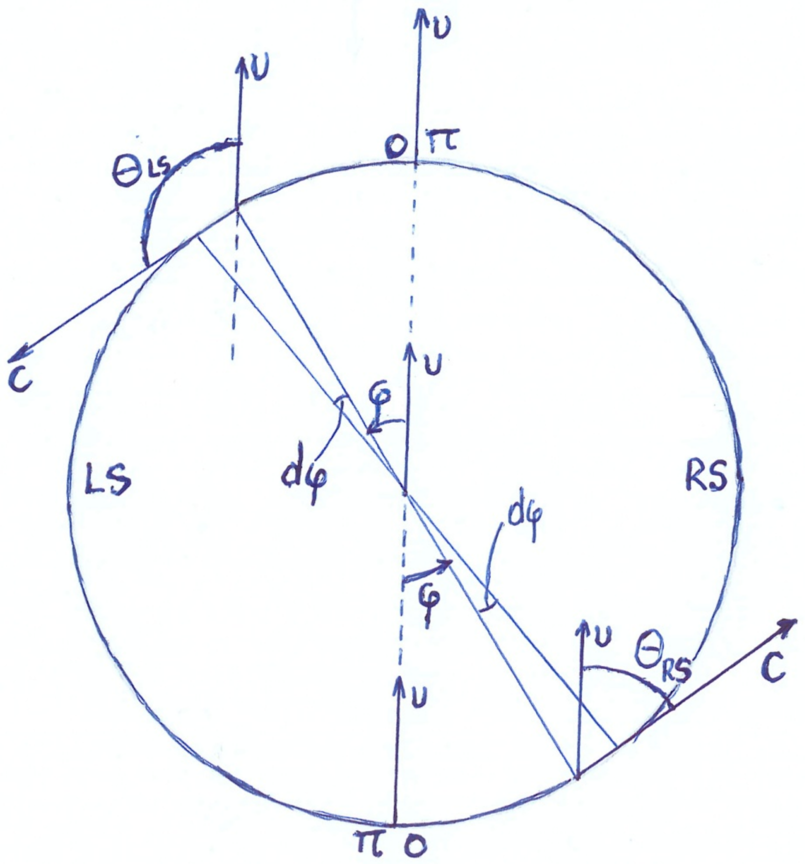

Fig.1

In the Fig.1 it is shown the CCWS propagation of the circulating photon inside the electron while it moves to the upper side of the page with velocity υ –in ether-; under these conditions the right-side (RS) of the circumference of the electron acquires locally higher "frequency-elements" and thus it gets a larger mean frequency $\langle \nu_{RS} \rangle$:

$$\langle \nu_{RS} \rangle = \int_o^{\pi} \frac{(\nu_o/2\pi)\ d\varphi}{\left[1-\frac{\upsilon}{C}\cos\Theta_{RS}\right]} = \int_o^{\pi} \frac{(\nu_o/2\pi)\ d\varphi}{\left[1-\frac{\upsilon}{C}\sin\varphi\right]} = \frac{\nu_o}{\sqrt{1-\frac{\upsilon^2}{c^2}}}\left[\frac{1}{2}+\frac{1}{\pi}\tan^{-1}\frac{\upsilon/C}{\sqrt{1-\frac{\upsilon^2}{C^2}}}\right] \quad (8)$$

(since it is $\Theta_{RS} = \frac{\pi}{2} - \varphi$)

While the left-side (LS) of the electron appears a reduction of the local frequency-elements and thus the mean frequency $\langle \nu_{LS} \rangle$ becomes smaller:

$$\langle \nu_{LS} \rangle = \int_o^{\pi} \frac{(\nu_o/2\pi)\ d\varphi}{\left[1-\frac{\upsilon}{C}\cos\Theta_{LS}\right]} = \int_o^{\pi} \frac{(\nu_o/2\pi)\ d\varphi}{\left[1+\frac{\upsilon}{C}\sin\varphi\right]} = \frac{\nu_o}{\sqrt{1-\frac{\upsilon^2}{c^2}}}\left[\frac{1}{2}-\frac{1}{\pi}\tan^{-1}\frac{\upsilon/C}{\sqrt{1-\frac{\upsilon^2}{C^2}}}\right] \quad (9)$$

(since it is $\Theta_{LS} = \pi - \left(\frac{\pi}{2} - \varphi\right) = \frac{\pi}{2} + \varphi$)

By addition in members of the relations (8) and (9) we get the known increase of energy (or mass) of the electrons with velocity:

$$h\langle v\rangle \equiv h(\langle \nu_{RS}\rangle + \langle \nu_{LS}\rangle) = \frac{h\nu_o}{\sqrt{1-\frac{v^2}{c^2}}} \qquad (10)$$

Conclusion. The increase of energy or of mass with the increase of the velocity (in ether) needs not any concentration of any "Higgs bosons" around the electron; the increase of mass simply is job of the ether (as it was assumed initially by the integration of Newton's equations by Lewis [4] –this proof also is reproduced in [5]-).

This law of increase of mass means the correctness of our theory of the circulating photon inside the electron (or positron).

References:

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[5] A.N. Agathangelidis "Relativity Replaced – Ether Found around Earth"
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