

MCS Physics

Article 4:

Energy

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Abstract

I deduce that the interaction between *EMPs* and space “units” (hereinafter *spacents*) is the origin of Energy and that mass is nothing more or less than “amount of kinetic energy”. This allows me to conclude that dark energy does not exist. I further deduce that the *EMP* is the minimal photon in nature and that *EMPs* move through space in the speed of light, not only when participating in photon constructions but also as constituents of fermionic matter. Fermionic matter does not exhibit, however, motion at the speed of light in the macroscopic scale of reality due to the spherical symmetry arrangement of the *EMPs* from which it is constructed. In the microscopic realm, however, fermionic matter is frenetically joggling at the speed of light. Accordingly, all universal matter is of zero rest mass. What we actually measure as the Mass of particles and bodies, is their light speed mass. Photons exhibit C in the macroscopic world due to their open non spherical structure. I postulate that statistically speaking, due to the relatively long idleness interval T_2 , elementary particle interactions are taken against a standing still universe.

Is the gravitational attraction of earth an obstacle or of assistance for flight?

Airplanes and birds have to fight against gravity in order to fly, but they do so taking advantage of the atmosphere, which is bounded to earth by the same gravity they should fight.

I mention this here as an example to a phenomenon having contradicting consequences. What gravitational attraction is for flight, space is for inertial motion. Hubble expansion results from the constant addition of space, due to the drag between space and matter. The same drag serves an essential basis for the formation of energy, mass and inertia, as I will shortly disclose.

Energeticless Space versus Dark Energy

In my previous article I postulated that space have drag effect on matter, a phenomenon which the Hubble expansion of the universe (which is an inseparable continuum of the big bang, governed by the same constant addition of space which its start is the start of the bang) is one of its observable manifestations. This drag moves galaxies apart when more space units constantly pop up in uniform distribution between existing ones. There is a simple answer, however, to the question why this drag does not kill inertial motion of matter constituents of galaxies: it occurs at the very point of creation of mass and motion, both being also manifestations of this same drag phenomenon. Richard Feynman’s argument in rejection of Le Sage theory of

gravitation, which I used for ruling out dark energy, is therefore irrelevant for ruling out the drag effect of space on matter: the drag between space and matter is the fulcrum which provides for inertial motion, and more accurately for any kind of motion, as will shortly become apparent.

In article 2, I concluded that particles, and *EMP* among them, inevitably operate in a cycle, which can be divided into three different time intervals: T_1 is the time it takes a particle to take in, T_2 is the time it takes it to process a taken input, and T_3 is the time it takes it to give off. It can therefore may be reasonably assumed that a particle interacts with the environment, i.e. with space and constituents thereof during two specific time intervals only: when taking in an input (i.e. during T_1) and when giving off an output (i.e. during T_3).

During the processing time, T_2 , there is no interaction between particles and space, i.e. particles go unnoticed by space during the processing time. Although this seems arguable at the moment should one assume the motion created during $T_1 + T_3$ is of a momentum greater than what being lost by drag during T_2 , it will become apparent from my following articles that there is no interaction between matter and space during T_2 , and that in this regard nature is very efficient and creates no excessive momentum for then just losing it due to drag.

The time during which particles can be dragged by an expanding space, is thus the time $T_1 + T_3$ during which all the doings of the particle with the outside world are carried out. All the same, since $T_1 + T_3$ is the only time during which a particle has “doings” with the outside world, this is the only time a particle can acquire mass, move, or become noticed at all.

Space, and not dark energy, is thus the most promising candidate to take responsibility on the Hubble expansion trick.

The origin of Energy

In the previous article I concluded that space is a continuum of units, from reasons yet to become self explanatory I take here the liberty to name “space cents” and abbreviate “*spacents*”, which enter the universe in a constant rate since the start of the bang (and which actually their gradual accumulation **is** the bang)¹. Liable to simplicity, I postulate that the particular input an *EMP* is taking in during the first time interval (T_1) of its cycle are *spacents*, or at least one *spacent* at a time.

Based on the assumption that drag between space and matter occurs only during T_1 and T_3 , but not during T_2 , the only grip an *EMP* has with space is through the mediation of a *spacent* it is momentarily taking in at T_1 , and through the mediation of a processed *spacent* it is momentarily giving off at T_3 . This teaches us that *spacents* are mutually sticky, and provide for a space fabric having foam like characteristics, a body which its constituents are dragged apart by new ones that pop up in between existing ones, while dragging with them any *EMP* momentarily interacting with them either by taking in or by giving off during its respective sub cycle periods T_1 and T_3 .

¹ One can find similarities between *Spacents* and Higgs foam or Higgs field. However, I find it more appropriate to totally distinguish between the two, since their conceptual origin, as well as their predicted physical origin, are totally different.

The stickiness of *spacents* is (i) between themselves, and (ii) between them and some inner structural components of the *EMP*, components that respectively serve for inputting and for outputting. These *EMP* components are unexposed to the outer world when not busy with taking in and with giving off, i.e. they make no drag when idle.

Based on the current assumptions it is clear that by taking in and by giving off, an *EMP* inevitably changes its position relative to the surrounding *spacents* foam. It simply has no grip in the foam for standing still and “pulling in” a *spacent*, disconnecting it from the foam’s grasp. Instead, it moves along the *spacent* it is taking in, and once fully absorbed, its grip with the foam is released. The *EMP* thus remains released from the foam’s grip during T_2 , but when starting to give off its processed *spacent*, during T_3 , a leading edge of the processed *spacent* immediately holds grip with the foam, causing the *EMP* to recede along the processed *spacent* until fully given off, and once again any grip between the *EMP* and the foam is being released.

At this point I am taking liberty to assume that the taking in and the giving off of an *EMP* occur in opposite directions of its construction. This means that an *EMP* has an axis of motion: it is taking in on one end of the axis, giving off on an opposite end of the axis, both said operations result with a motion of the *EMP* in the direction of taking in. As will become clear through my following articles, this “axis of motion” assumption perfectly fits with the physical phenomena associated with gravitation and with motion.

In order to symbolize *EMPs* in future conceptual drawings, I propose to use the icon Œ , a ligature^{II} of O and E, in which O is aimed to represent the giving off; the mid horizontal line of the E is aimed to represent the axis of motion as well as the taking in; E is a shortcut for *EMP*; and OE can stand for Origin of Energy.

Energy

The description of the cyclic motion an *EMP* is exercising through space, is the description of the most fundamental motion in nature. It is a motion in which a predetermined given distance (predetermined by the uniform size of *spacents*) is being traversed during each *EMP*’s cycle, within a given time ($T_1+T_2+T_3$). A predetermined distance traversed within a predetermined time means a constant speed motion. Since there is only one universal constant speed I am familiar with, a very fundamental one you surly agree, I postulate that *EMPs* move through space exactly at the speed of light.

Somewhat analogous to the propagation of sound at the speed of sound, which is the root mean squares of the velocities of molecules constituting the carrier medium, and since space is made of *spacents*, i.e. it is not of a smooth continuous pattern at the scales at which the speed of light originates, I hypothesize that actually, at the microscopic *spacent* scale of distances, *EMPs* travel at $C\sqrt{2}$. This value averages to C when a structure comprising multitudes of *EMPs* propagates through space as a whole, along a geodesic. Note that since during T_2 of the *EMP*’s cycle there is no motion, the momentary speed of an *EMP* during T_1 and during T_2 may be much

^{II} In MS Word you can type this ligature by Cntrl+Shift+& and ‘o’.

greater than $C\sqrt{2}$, depending on the ratio between these time intervals and the entire cycle duration. We will return to discuss this issue briefly, later in this article.

You may justifiably ask how comes that matter, which according to MCS Physics its building blocks are light speed moving *EMPs*, looks stationary. I postulate that the *EMPs* from which fermions are constructed, are arranged from all sides of the particle with their axes of motion in radial orientation, hereinafter “spherical symmetry”. I further postulate that the cycles of *EMPs*, though identical in duration, are phase shifted. Accordingly, while in the microscopic realm *EMPs* are frenetically joggling due to successive phase shifted speed of light leaps exercised by *EMPs* from all directions, in the macroscopic scale they look stationary (see Fig. 5.1 of the following Article), since the spherical symmetry makes the directional leaps averaging up to zero.

I further postulate that the spin of elementary particles is nothing more or less than the momentum associated with a non radial vector component of the velocity of a momentarily^{III} active *EMP* constituent of the elementary particle. I will discuss this issue in detail in later articles, however, you can realize already from this brief, why a quantum spin is independent of a particle’s mass and of a particle’s radius, as well as why it is quantum.

Based on the above, the kinetic energy eE_k of an *EMP* is equal to half its mass eM multiplied by the square of its velocity, namely

$$eE_k = \frac{1}{2} eM \cdot (C\sqrt{2})^2 = eM \cdot C^2$$

{4.1}

From Article 1 you already know that the mass of a body is the sum of elementary masses eM constituting it, so it follows from {4.1} that the energy E in the Einsteinian equivalence $E=M \cdot C^2$ can only be interpreted as kinetic energy.

It is crystal clear accordingly, that mass is nothing more or less than “amount of kinetic energy”, wherein kinetic energy is a motion of an *EMP* through space.

Moreover, it is crystal clear that the origin of said kinetic energy is in the interaction between *spacents* and *EMPs*. *EMP* is not energy, and have no hidden energy stored. *Spacents* are not energy as well, and hide no stored energy. Energy is **originated** in the fundamental interaction **between** an *EMP* and a *spacent*. There is no energy without space, and there is no energy without matter. Energy is **cyclically created** by the *EMP- spacent* interaction.

Note, that the kinetic energy thus repetitively born, gives rise to the Newtonian dynamics. Newton laws are irrelevant for massless systems, thus nothing more fundamental to the formation of mass obeys Newton laws. Accordingly, no energy is required to fuel the interaction between an *EMP* and a *spacent* (see also footnote #2 of Article 1).

^{III} Later in this article, and in the following one, I explain that statistically speaking, no more than one *EMP* is active at a given instant, i.e. T_1 and T_3 of different *EMPs* rarely overlap (see Fig. 4.1).

Based on the above we know already that the mass - energy equivalence, is not an equivalence between two types of energy. Mass is “amount of kinetic energy”. From the above and further supported by the remaining of this article we can estimate already that there is no “dark energy”, at least not exteriorly to the human imagination.

It further follows, that the *EMP* is also the smallest photon in nature. Multitudes of *EMPs* tethered together in predetermined structures and numbers form all greater photons. As we know, photons are absorbed and emitted by fermionic “elementary” particles every now and then. Once we came to the conclusion that elementary particles are composed constructions of *EMPs*, and further concluded that *EMPs* travel at the speed of light, there is no sense in discriminating between the constituents of fermionic and bosonic matter. Both are composed constructions of *EMPs*. It is thus clear that also the energy carried by photons (which are believed to be the carriers of electromagnetic energy) is nothing more or less than kinetic energy. Differently than fermions, photons exhibit motion at the speed of light in the macroscopic world, since they are of open non spherical arrangement of *EMPs*.

The number of possible types of energy in the universe will continue to shrink in my following articles, and it will become more and more apparent that probably there is no type of energy in our universe other than kinetic.

Are photons massless?

Since we came to conclude that the mass of all elementary particles is nothing more or less than the amount of kinetic energy resulting from the motion of the *EMPs* participating in their constructions, at the speed of light, the conclusion that the rest mass of all elementary particles in nature is zero, is unavoidable.

Since photons are made of *EMPs* and since *EMPs* are responsible for the mass of all elementary particles, photons have zero rest mass like all other particles, and do have light speed mass like all other particles have. For the sake of good order I should say that in a universe in which all matter is in the speed of light, the term “rest mass” lose its essence.

The consequences of the indications made in this article on the validity of relativity theories will be discussed in my next article titled *Relativity's Nightmare Universe*.

Dark Energy: : unnecessary and incapable

As can be appreciated, the motion of an *EMP* along its axis of motion due to taking in and giving off, is taking advantage of its drag with space, for moving **through** space. Simultaneously with this relative motion between the *EMP* and its surrounding *spacents*, the *EMP* is subjected to the motion of the surrounding *spacents* as a whole, resulting from the modified Hubble expansion as suggested in Article 3. The latter motion which its origin is in the constant addition of *spacents* into the universe, has no impact on the first motion, which its origin is in the operation cycle of the *EMP*. Accordingly and as anticipated in Article 3, Richard Feynman's argument is irrelevant here, and dark energy is redundant, i.e. does not exist: space itself is the “something” which does the trick and pushes galaxies apart.

Note, that this simple approach is potentially true independently of the gravitational relations between receding galaxies: even if you insist of holding that all universal galaxies are gravitationally bounded (an approach which I am taking the challenge to prove false through these series of articles), whenever the rate of Hubble expansion is greater than the rate galaxies acquire velocity due to their hypothetical mutual attraction, still they will recede. If you really believe that gravity is not a force (an approach which I am taking the challenge to prove true through these articles), you should accept my approach that space itself, by its constant addition, without the help of vacuum energy or of any other sort of energy, can do the trick of pushing galaxies apart. Anyway, unless its proponents can hypothesize how it interacts with galactic matter without killing its inertial motions, Feynman’s argument leaves no space for dark energy to exist.

Standing still universe

After examining different possibilities for the ratio between the three time intervals constituting the constant cycle of *EMPs*, I came to a conclusion, which to my opinion best fit with all sorts of observational data relating to gravitational phenomena, and provides for an extraordinary prediction power. My conclusion is that $T_1 + T_3 \ll T_2$.

Actually, the processing time interval T_2 of an *EMP* operation cycle is so long, or vice versa, its taking in and giving off intervals are so brief, that the probability for two *EMPs* in the same system (and perhaps in an entire galaxy, or moreover in the entire universe) to take in or give off simultaneously, tends to zero. This is exemplified by Fig. 4.1.

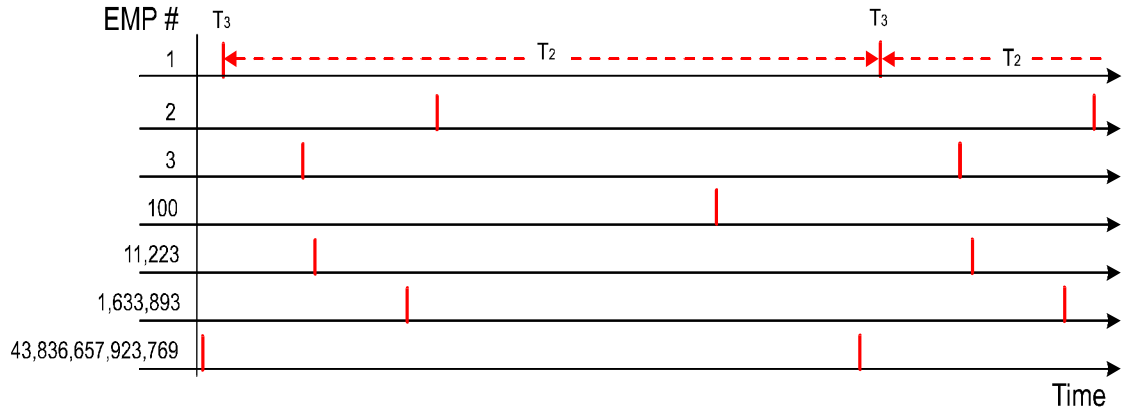


Fig. 4.1 The hypothetical time lines of seven *EMPs* arbitrarily selected from a hypothetical system comprising zillions of them, are demonstrated. The processing time T_2 of the *EMP*’s cycle is extremely long comparing to the giving off time T_3 represented by red vertical lines. The cycles of the *EMPs* are identical in duration, but are phase shifted coincidentally. The chance that two *EMPs* in the system will operate in an exact phase correlation is very low. Each *EMP* is thus giving off its processed *spacnet* discretely, and may be considered as interacting with a standing still universe (in this Fig. T_1 of the *EMP*’s cycle is ignored in purpose, from reasons that will be understood after reading my following articles).

It follows that according to MCS Physics, statistically speaking, particles interact with a standing still universe. Each interaction leaves its own quantum influence, tiny as it is, on the universe, such that a next interaction taken by a phase shifted *EMP* occurs in an infinitesimally changed universe. These infinitesimal changes continue to accumulate until the entire universal *EMPs* complete one cycle. When the *EMP* whose action (either a take in or a give off) was the first in the cycle, wakes up to its

next cycle it encounters a significantly changed environment, due to said accumulation during the previous cycle. Interference between *EMPs*' interactions is a matter of probability. Due to the shortness of T_1 and T_3 in comparison with T_2 , said probability is of an extremely small value.

All the *EMPs* in the universe experience similar conditions, since all their doings sum up to taking in and giving off from/to a standing still universe. Their only disturbance is the pop up of space units into the universe according to the modified Hubble law disclose in Article 3. The continuity of the expansion of space assures that all the *EMPs* in the universe are exposed, independently of their phase shift, to the same drag effect, which results with the Hubble expansion. But, as already mentioned, the expansion originated drag has no effect on inertial motion of matter, since inertial motion (the detailed mechanism of which I will disclose in following articles) is created by the taking in and the giving off operations of the *EMP*, operations which occur between an *EMP* and individual spacents with which it is momentarily interacting, which as far as they are being dragged due to the Hubble expansion they are dragging also the *EMP* with them, momentarily, thus remain stationary from the *EMP*'s perspective.

Finally, it should be noted that since all the motions of the *EMP* through space occur only during very short instances (marked T_3 in Fig. 4.1) of its entire cycle, its actual momentary speed is undoubtedly orders of magnitude greater than C . The observable speed of light C , is the average speed after counting for the long term idleness of *EMPs* during T_2 .

My next article is dedicated to the impact of a universe in which all matter is on an equal footing on the validity of relativity theories.

Article sum up

Space is a continuum of sticky *spacents*. The constant rate of *spacents* pop upping into the universe is what makes space to exhibit its Hubble expansion.

Spacents have drag effect on *EMPs* only during T_1 and T_3 of the *EMPs*' cycle.

EMPs move through space in a speed of $C\sqrt{2}$ in the microscopic realm. This speed is averaged up by composed constructions of *EMPs* which exhibit directional motion at C in the macroscopic world.

Mass is amount of kinetic energy.

Kinetic energy is a motion of an *EMP* through space.

The interaction between *EMP* and space is the origin of energy.

Energy is created cyclically by said interaction.

Dark energy is both redundant for and incapable of producing the Hubble expansion.

Statistically speaking, particles interact with a standing still universe.

Glossary

eE_k the kinetic energy of an *EMP*

Spacent “space cent”, a “unit” of space; pop up into the universe in a constant rate since the bang; taken up by *EMPs* during T_l of their particle cycle.

CE an icon resembling *EMP*, especially in drawings; a ligature of O and E

