

'It from bit' equally 'bit from it'

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Abstract

Essay considers nature as digital ('it') including its digital observers like us. Because, analog part of nature, if that would be fundamentally there, does not emit digital information to detect it digitally or, even, non-digitally. There's only a digitally perceivable 'it', which is a sum of all intrinsic quantized systems or wave-corpuscular-phenomena (WCP) ranging from micro to macro scales including macro-most, i.e. universe; where quantization in each of those WCP is due to presence of some quantized common parameters ('bit') therein. Since de Broglie's wave-corpuscular inverse relation, between two of such 'bit's (mass and wavelength), is common in all WCP, it can be stretched to a common inverse relation by inducting other 'bit's like space, time, motion etc. That new relation depicts 'it' as a product of its two inverse sets of 'bit's where 'it' and 'bit' are inseparable.

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A learner of philosophy linked to ground rules of nature, an independent thinker, associated with charity and graduated in Science. Current essay is partially based on some core ideas in his paper which is now waiting for publication in winter issue 2014 of 'Galilean Electrodynamics', from USA.

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1. Introduction:

Is Nature an analog or a digital? To define whether 'it from bit' or 'bit from it', it is obligatory to spell out first whether the nature would be analog or digital, an absolute continuum or quantum respect to an observer who has only one choice i.e. digital.

Digitized observations: There were so many hypotheses to explain the basic nature in analog way, though all such propositions were not just from the arena of physics. Those were from the different branches of metaphysics and some schools of spirituality as well over the ages. In physics, the most prominent analog hypothesis was the concept of 'ether', a fundamental continuum for everything; but yet to be detected through experiments. It is not only for the 'ether', the detection of any such hypothetical analog propositions for fundamental nature is still a challenge to modern experiments.

On the other side, all the observers (like us) along with all scientific instruments therein are intrinsically digitize while defining any such analog propositions of the nature. Can a digital

observer detect a *continuum* (or analog state) of nature, which is supposed to be in further fundamental level than the observer is? Probably the answer would be a negative.

The digits or quanta are basic tools (or messages) in any digital observations. Those digits or quanta cannot emit from a non-digital or analog origins. Then nature that perceives through such digits or quanta must appear as a digital. Therefore, the process of observation must be an observer dependent process, where observation exclusively depends on the type of that observer, i.e. digital or analog. If that observer is digital then nature would appear to him as digital. Conversely, if observer supposes an analog then it would appear as an analog.

Therefore, we can consider that the digital observers (like us) have a natural limit to detect the nature non-digitally, even if it would be non-digital anywhere in its deeper levels beyond that digital limit. So, all our present accepted wisdom about nature would be digital instead of analog. Then in proceeding paragraphs, we confine only in an episode of a digital nature (DN).

The digital Nature or 'it': That DN or 'it', depending on current understandings in physics, is a sum of all quantized or digital systems or wave-corpusecular-phenomena (WCP) or 'particles' from all possible count of micro to macro scales, where any macro system comprises a definite number of micro systems. Few examples of such macro to micro scales of systems (MMSS) in nature may be like: particular astronomical system with a scale specific magnitude of mass, molecules of a particular element, atoms of a specific element, protons of a particular mass-energy, electrons of particular mass-energy, photons of a particular mass-energy and so on.

The macro most system among all those scales in the nature would be the universe itself and we do not accurately know whether there any other such universe in DN. Therefore, the DN, which appears as a sum of all MMSS, with at least one realizable macro-most system (i.e. universe) and one conceptual micro most system, which is, still an overwhelming quest in experimental physics.

A scale of systems: A particular scale of systems is a class for all existing identical systems or WCPs, which are spreaded all over the DN. If it would be suppose for a scale or class of normal hydrogen atoms in ground state of mass-energies, then it would conceptually include all similar hydrogen atoms, which are in existence through out the DN. Even it would be a scale of a particular massive body (with any specific magnitude of mass), then it would stand for all the similar systems which are scattered through out the same DN.

2. A common intrinsic property in digital nature:

That is intrinsic quantization in both 'bit' and 'it': Since every system in all MMSS is possessed common *intrinsic quantum discreteness in magnitude* (IQDM) or a digitization property, the DN as a sum of all MMSS would also have the IQDM.

But through various observations in particle physics, astro physics and in others it is now well known that all those different MMSS are mainly differ in scale specific IQDM of some *common internal parameters* (CIPs). Those CIPs, even can consider as basic constituents, in any systems under MMSS and as basic 'bit's as well in the systems. Few examples of such CIPs would be like inertial mass (m), de Broglie's wavelength (λ), space (s), time (t) etc. in all MMSS. However, inertial mass and de Broglie's wavelength are well accepted CIPs with scale specific IQDM in Quantum Mechanics (QM), but whether inertial space, inertial time etc have same IQDM in all

systems under MMSS is a question. The proceeding paragraphs will deal with the topic in more detail.

Two types of constants are associated with both ‘it’ and ‘bit’: However, from observations in QM it is also well recognized that above scale specific IQDM of any particular CIPs are observer-independent universal constants e.g, the IQDM of m of a normal hydrogen atom in ground state of mass-energies is constant every where in all similar hydrogen atoms. That is m of that hydrogen atom has an observer independent universal constancy in IQDM through out the DN. Hence the IQDM of any CIPs can regard as a *scale-specific-universal-constant* (SSUC) but only for that specific scale of systems rather than any ‘universal-constant’ (UC) irrespective of all MMSS in DN.

3. Common internal parameters & their inter-relationships:

3.1. Mass & de Broglie’s wave length – two ‘bit’s:

The de Broglie’s wave-corpouscular relation

$$m \cdot \lambda = h/c \tag{1}$$

suggests that m & λ are two CIPs and both are SSUCs for their IQDM in all MMSS in DN, where h and c are Planck’s constant and constancy in inertial speed of light respectively. In above relation we may have also

$$m \cdot \lambda = h/c = k_1 \tag{2}$$

where magnitude of k_1 should be a UC irrespective of all MMSS unlike m & λ . If the unit of h considers in $\text{gm-cm}^2/\text{sec}$ and c is in cm/sec , then the unit of k_1 in Eq. (2) will be in gm-cm .

3.2. Inertial Motion – another ‘bit’:

Quantized vs Relative Inertial Motions: In both QM and Relativity Theory (RT), it accepts that every MMSS in DN has an intrinsic inertial motion (v). However, in some scales, particularly in some micro scales, that v shows its scale specific IQDM while in some other scales, mostly in macro scales, it appears as relative.

In a scale of photon, we have for that $v = c$ where c in QM can be considered as a scale specific IQDM of a photon-WCP and similarly in RT it is as a constant inertial motion of light (unlike relative motions of macro systems). Then concepts of intrinsic inertial motion of a photon in QM and the inertial motion of light in RT show the same SSUC. However, there are also so many other micro scales of systems in DN, under domain of QM, which show their similar scale specific IQDM as like as photons but with intrinsically different scale specific magnitudes. Therefore, each of those different scales specific IQDM of v , correspond to different micro scales, are nothing but similar kind of SSUCs in DN as like as c of photons. The intrinsic inertial motions as observed in neutrinos, electrons, normal hydrogen atoms and in so many other particles would be the few examples of such different SSUCs in DN with respective IQDN. Therefore, we can consider that the conventional equations in Special Relativity Theory (SRT), for relative time, space, mass etc. respect to c (where $v = c$ of photons), are mechanisms, where any such scale specific IQDM motion (with SSUC) were first introduced of its kind to universalize relative motions in the domain of macro scales of systems or ‘massive bodies’.

Those ‘massive bodies’, in other way, are nothing but the WCPs in Eq. (2), which are also the sums of corresponding scale specific number of micro scales of WCPs where each of such micro WCPs contains some scale specific IQDM of v no matter whether those magnitudes of v could

be measured through available measuring processes or not. Then motion in macro scales of WCPs that appears to us apparently relative may have scale specific IQDM as like as same in their corresponding constituent micro scales of WCPs.

Different inertial motions of photons: In Eq. (2), we have different IQDM of m & λ for photons on electromagnetic spectrum (EMS). So, each of those photons on EMS with corresponding different IQDM of λ and m can be considered as different scales of photons as like as other MMSS in DN. However, in SRT, it is considered on EMS that all such different scales of photons have a common IQDM i.e. $v = c$.

Even though in some quantum entanglement experiments it has been claimed ^[a] that the microwave photons, which are at one end of the EMS where the corresponding scales of photons have higher IQDM for λ but lower for m , have corresponding IQDM of ($v > c$). On contrary, it can also be defined that the photons, with lower IQDM for λ but higher for m on the same EMS, would have lower IQDM of ($v < c$) depending on the principles of universal momentum conservations before after collisions of particles. In a phenomenon of an electron-positron pair annihilates through collision pair of gamma ray photons formed. If the sum of the inertial masses of particles in those two pairs are equal and the magnitudes of the λ of two gamma-ray photons are identical, then there would be ($v_\gamma = v_e$) $< c$ due to conservation momenta in colliding particles; where v_γ and v_e are the respective inertial motions of the corresponding gamma-ray photons and electron (and positron too). We know that gamma-ray photons are at the opposite end of micro-wave photons on EMS where the corresponding scales of gamma-ray photons, on contrary to micro-wave photons, have their lower IQDM for λ but higher for m . Then we can consider that, on EMS, there are different IQDM of v or *quantize inertial motions* for different scales of photons which would have both smaller and higher values than c .

If considers c as a mean inertial motion for both smallest and highest ends of IQDM of λ with corresponding scales of photons on the EMS, then c would be the inertial motion of another specific scale of photons some where in middle of the same EMS.

Identical Inertial Momentum of all Photons: In above paragraph it appears, the scales of photons at micro wave end on EMS with IQDM of higher λ (and vis-à-vis lower m) are possessed corresponding ($v > c$) and conversely the scales of photons at gamma-ray end of the same EMS with lower λ (and vis-à-vis higher m) have ($c > v$). As if, the m and v show an inverse relationship in all scales of photons on the EMS

$$m \propto 1 / v \tag{3}$$

and also suggests that on the same EMS all scales of photons would have a common and constant inertial momentum. The m and v for photons in Eq. (3) are obviously the SSUCs. Then we can rewrite the Eq. (2) through Eq. (3) by the above three IQDM of inertial motions of ($v_\gamma < c$), ($v_c = c$) and ($v_\eta > c$) correspond to their IQDM of m and λ as

$$m_\gamma \cdot \lambda_\gamma = h/v_\gamma = k_1 \tag{4}$$

$$m_c \cdot \lambda_c = h/v_c = k_1 \tag{5}$$

$$m_\eta \cdot \lambda_\eta = h/v_\eta = k_1 \tag{6}$$

where v_η is the IQDM of v for a micro-wave photon on EMS. Then in Eqs.(4)–(6) h should be also a SSUC as like as v , m & λ if k_1 is a UC in Eq. (1). Then we have again for the h with all its SSUCs in Eqs. (4)-(6) as

$$m_Y \cdot \lambda_Y = h_Y / v_Y = k_1 \quad (7)$$

$$m_c \cdot \lambda_c = h_c / v_c = k_1 \quad (8)$$

$$m_\eta \cdot \lambda_\eta = h_\eta / v_\eta = k_1 \quad (9)$$

The we can write from Eqs. (7) - (8) as

$$m_Y \cdot v_Y = h_Y / \lambda_Y = k_2 \quad (10)$$

$$m_c \cdot v_c = h_c / \lambda_c = k_2 \quad (11)$$

$$m_\eta \cdot v_\eta = h_\eta / \lambda_\eta = k_2 \quad (12)$$

where k_2 is also another UC irrespective of scales of photons on the EMS. That is, in inertial state, all scales of photons in DN have a constant momentum or k_2 .

Identical Inertial Momentum of all micro to macro scales of systems: Micro scales of WCPs, including photons on EMS, are building blocks of all macro scales of WCPs or systems where micro systems have scale specific IQDM of v . Then logically the macro scales of systems may have similar kind of scale specific IQDM of v . So, if it is *postulated* that in inertial state, all the MMSS in DN have corresponding scale specific IQDM of v , then the magnitude of k_2 in Eqs. (10) – (12) would be another UC irrespective of MMSS in DN as like as k_1 in Eq. (2). That is, ultimately, all MMSS in DN would have a constant inertial momentum or k_2 and we can generalize all the Eqs.(10) – (12) respect to different scales of photons on EMS to all MMSS in DN as

$$m \cdot v = h/\lambda = k_2 \quad (13)$$

where the unit of k_2 would be in gm.cm/sec.

3.3. Inertial Space & Anti-space – next two ‘bit’s:

Inertial Space: In the digital nature, space would have some realizations to digital observers (like us) accoring to current understandings in physics:

(i) Non-void space: Now it known, particularly in QM, that any digital process of observation is ultimately a process of receiving and analyzing of quantize or digital data or messages from another quantize object or source, which is under focus to observe. Because from any continuum or analog or perfect *void* source any digital or quantize message cannot emerge or receive to observe the same. Then as like as ‘ether’ as a concept of fundamental continuum in classical physics, a perfect void is also not detectable digitally as well, even if it would be there in nature.

Then the observable space would be only a digitally detectable space (say s) in DN to the observer like us. The DN is, as per our considerations in above paragraphs, a sum of all MMSS. The s can consider as quantize *volumes* of all those MMSS, which *fill up* by the IQDM of materials in all same MMSS. That pre-occupied non-void space are defined in any inertial frame by $s = (x, y, z)$ by three conventional dimensions of space through units or digits. One example of such non-void or digital volume in micro scales would be the IQDM of scale specific volume for a normal hydrogen atom, in its ground state of mass-energies. Therefore, every scale of MMSS in DN has quantized volumes or non-void space, i.e. s .

(ii) Curved non-void space: Since s is a non-void volume of scale specific systems or WCPs then it is obvious that s would curved too as it has known from the domain of General Relativity (GR) particularly for the macro scales of systems. For convenience, if such quantized volumes of space in all MMSS can consider as non-void perfect spheres, then we may have for the volume of any systems

$$s = 3\pi r^2/4 \quad (14)$$

where r is the corresponding quantize radius of all MMSS; and the volume of digital nature might be a sum of all such quantized volumes of systems in it.

(iii) Non-void Space is inseparable from time: The concept of non-void space or s is practically meaningless without realization of a simultaneous time or vice versa.

(iv) Intrinsic left-handed rotation of non-void space: In digital nature, it has also realized that all those MMSS in DN are intrinsically left-handed or clockwise rotating ^[b] on respective axes. The non-void space or s in Eq. (14) is a quantize volume of all such MMSS. Therefore, that s would have also a conceptual intrinsic left-handed or clockwise rotation on the same axes. That is s in Eq. (14) is not a static quantity and has an intrinsic left-handed direction beside scale specific IQDM.

Inertial Anti-space: Every object, which has an intrinsic left-handedness, must have a simultaneous mirror image e.g. intrinsic right-handedness. Since in Eq.(14), the $s = (x, y, z)$ has an intrinsic left-handed or clockwise rotations around the axes respect to all MMSS, there would be an intrinsic right-handed or anti-clockwise rotations of its mirror image respect to the same MMSS. That mirror image of s can be termed as *anti-space* (say s_u). Since that left-handed rotation of space or quantize volume is associated with all respective MMSS, that s_u would also intrinsically associate with the same MMSS. Therefore, we can define such an anti-space as

$$s_u = 3\pi r_u^3/4 \quad (15)$$

where r_u is a mirror image of r in Eq.(14). Therefore, the s_u in Eq. (15) would be also not a static quantity but with a right-handed intrinsic direction beside scale specific IQDM and s_u would have unit in cm.

Relation of Inertial Space and Anti-space: In above Eqs.(14) & (15), the (s & s_u) as well as (r & r_u) are quantized, conceptually co-existing and mirror image of each other. Therefore, both (s & r) would possess an inverse relationship with respective (s_u & r_u) in all MMSS with scale specific IQDM. Since r has scale specific IQDM in all MMSS, then, in Eq. (14), the s would also have the scale specific IQDM in all same MMSS. Similarly, the (r_u & s_u) in Eq. (15) as respective mirror images of (r & s) in Eq.(14), then both of the (r_u & s_u) would also have their scale specific IQDM in all same MMSS. Hence, each of the (r , r_u , s & s_u) with IQDM would have the SSUCs as like as (m , λ and ν) in Eqs. (2) & (13) respectively in every MMSS in DN. So we have the inverse relationships in between (r & r_u) and (s & s_u),

$$r \cdot r_u = k_3 \quad (16)$$

and (s & s_u) as

$$s \cdot s_u = k_4 \quad (17)$$

where both k_3 & k_4 in Eqs. (16) & (17) respectively must be two other UCs as like as k_1 & k_2 in Eqs.(2) & (13) for all MMSS; and from the units of r (or s) in cm in Eq. (14), the units of the k_3 in Eq.(16) would be in cm^2 and for the k_4 in Eq. (17) the unit would be in cm^6 from Eqs. (14) & (15).

3.4. Inertial Time & Anti-time – last two ‘bit’s:

Inertial Time: The time shows the following major realizations in non-void horizons of any digitized observers (like us):

(i) Non-void-time is inseparable from non-void-space: Because

- There are digital limitations of observers, like us, to detect any analog-object through the digital signals or messages. An analog-object cannot emit any digital signal or message through which that could be detected.
- A hypothetical *perfect void* as well cannot emit any quantize or digital signals through which that could be defined.
- Since a digital observer cannot define a perfect void, that observer cannot define a time also in that void. Therefore, he cannot say whether time in any void is associated with space.
- But, in the domain of digital nature, the times (say t) is conventionally detected by receiving any digital or quantize signals (or messages) from any digital or non-void objects.
- Then, any such detectable magnitude of non-void-time are defined in terms of distances in space, which may be in terms of angular *distances* in clocks or specific orbital *distances* in atomic or other WCPs, or even it can be in *linear distances* what we will see in the proceeding paragraphs.
- That is a non-void-time is inseparable from the non-void-space in DN.

(ii) The quantized non-void-time: In conventional as well as classical mechanical sense of digital time, the t in the clocks is clockwise 360° circumferential movements of the hands. For one unit magnitude

$$t = 2\pi. r = 360^\circ \quad (18)$$

where the magnitude of that 1 unit of t can be defined in terms of angular distances in units of second, minutes, hours etc. However, the magnitude of that one unit of t, in classical mechanical sense of definition, would be universally equal in all inertial frame of reference or scales of systems with relative motions. In SRT, the same 1 unit of t in Eq. (18) would have the different or relative magnitudes depending on the relative motions of the same inertial frames of reference. However, the SRT principles cannot say anything in relevance of whether that t in Eq. (18) possesses scale specific IQDM in all MMSS of DN.

Conceptually, if we can imagine all those MMSS in DN, with corresponding IQDM of the s in Eq. (14), as classical mechanical or SRT clocks in Eq. (18), then same 1 unit of t would have different scale specific IQDM. That difference in IQDM of t, in Eq. (18), cannot define through universally identical angular distances in all those clocks. If the t in Eq. (18) considers, through Eq. (14), as quantized circumferential distances with scale specific IQDM of r in all MMSS, then t would have the IQDM in all same scales of MMSS. Hence, we can define t in Eq. (18) with scale specific IQDM in all MMSS as

$$t = 2\pi. r = 1 \text{ unit} \quad (19)$$

where t would have a non-angular unit i.e. in cm instead of conventional unit in sec. That t in Eq. (19) would be definitely a digital or non-void-time but with scale specific IQDM as well in all MMSS of digital nature unlike relatively variable or non-intrinsic concept of t in inertial frames of reference with relative motions in SRT. That is t in Eq. (19) would be a quantized time. Example of such t in Eq. (19) can observe in process of counting time based on non-angular orbital distances of moon around the earth or of earth around the sun or of an electron around the nucleus of convenient atom and so on.

(iii) Time has left-handed flow: Both of the expressions of t in Eqs. (18) & (19) have left-handed or clockwise rotations; and the flows of t in both of the clock in Eqs. (18) & (19) would have clockwise direction in its flow i.e. from *past to present to future*.

Inertial Anti-time: Since the t in Eq. (19) has scale specific quantized magnitudes, flows in clockwise direction and inseparable from s in Eq. (14), there would be a mirror image counter part of t as like as s_u of s in Eq. (15); and we can denote it as anti-time (say t_u). Then we can express t_u as a mirror image of t in Eq. (19) as

$$t_u = 2\pi.r_u = 1 \text{ unit} \quad (20)$$

where t_u would be inseparable from s_u , with unit in cm and intrinsic quantized IQDM correspond to all scales of MMSS due to same for r_u in Eq. (14) and with a simultaneous reverse flow in all systems i.e. right-handedly from *future to present to past*. The example of such simultaneous reverse flow of both t and t_u can realize in a photon-WCP on EMS. We know that during astronomical observations, more and more one observes or rather receives a signal (photon) from the distant astronomical objects (i.e. equally from the distant 'pasts' too), that photon-WCP as a signal or message travels to reach the observer from more and more 'past' to its 'future' (the moment, when it received by the observer). The photon-signal, during its course of travel carries a snap of an event from 'past' to that observer cum receiver in 'future'. Equally, the same photon-signal as well simultaneously carries the observer cum receiver in 'future' to that event which had occurred in the 'past'. Then, as if, in the same photon-signal WCP, the both t and t_u are simultaneously flowing in reverse directions.

Relation of Inertial Time and Anti-time: Since (s & t) as well as (s_u & t_u) are inseparable and (r & r_u) in Eq. (16) has inverse relation, we would have another inverse relationship for the both of (t & t_u) as mirror image of each other

$$t \cdot t_u = k_5 \quad (21)$$

where k_5 would be another UC irrespective of all MMSS in DN as like as all above k_1, k_2, k_3 & k_4 , and its unit in cm^2 from Eqs. (16), (19) & (20).

4. Universally common inverse definition for all scales of systems in 'it':

Since λ in Eq. (2) and r_u in Eqs. (15) & (20) are appeared equivalent in all MMSS, we can *postulate* that ($\lambda = r_u$). Then we may have from Eqs. (2), (13) and (16)

$$(k_2 \cdot k_3) / k_1 = v \cdot r = k_6 \quad (22)$$

where k_6 , as another UC irrespective of all MMSS, would have unit in cm^2/sec . Hence from all above Eqs.(13), (17) & (21) we may have two inverse or mirror image sets of CIPs or bits for all MMSS in DN,

$$(m.s.t) \cdot (v.s_u.t_u) = k_2.k_4.k_5 = k \quad (23)$$

where k would be the ultimate UC irrespective of all MMSS in DN and its unit would be in $\text{gm-cm}^9/\text{sec}$. Then Eq. (23) would be a common digital definition for all possible MMSS including the universe in digital nature.

5. Few other consequences:

5.1. Special Relativity Principles correspond to c becomes Local: Since in Eq. (11), $c = v_c = (k_2 / m_c)$ as a SSUC which is nothing but one of such so many scale specific IQDM of inertial motions correspond to all MMSS in the digital nature, then SRT relations

$$E = m_0 \cdot (v = c)^2 , \quad (24)$$

$$m^* = m_0 / \sqrt{(1 - v^*)^2 / (v = c)^2} , \quad (25)$$

$$t^* = t_0 \cdot \sqrt{(1 - v^*)^2 / (v = c)^2} , \quad (26)$$

$$s^* = s_0 \cdot \sqrt{(1 - v^*)^2 / (v = c)^2} . \quad (27)$$

respect to only one of such SSUC scale specific IQDM of inertial motion ($v_c = c$) would definitely become a *local* rather than universal irrespective of all MMSS. Then we may have one universal SRT relation from Eq. (11) as

$$E = m_0 (k_2 / m)^2 = m_0 (h / m \lambda)^2 = m_0 (k_2 / m)^2 , \quad (28)$$

$$m^* = m_0 / \sqrt{(1 - v^*)^2 / (k_2 / m)^2} = m_0 / \sqrt{(1 - v^*)^2 / (h / m \lambda)^2} , \quad (29)$$

$$t^* = t_0 \times \sqrt{(1 - v^*)^2 / (k_2 / m)^2} = t_0 \times \sqrt{(1 - v^*)^2 / (h / m \lambda)^2} , \quad (30)$$

$$s^* = s_0 \times \sqrt{(1 - v^*)^2 / (k_2 / m)^2} = s_0 \times \sqrt{(1 - v^*)^2 / (h / m \lambda)^2} , \quad (31)$$

respect to all scale specific IQDM of inertial motions (k_2/m) in all MMSS in digital nature.

5.2. On debates of ($v > c$) in Special Relativity Theory: In universalize SRT Eqs. (28)-(31), if any specific scale of systems possess ($v > c$), as like as $v_\eta = (k_2 / m_\eta)$ in Eq. (12), with corresponding ($m < m_c$), that must possess a superluminal speed within the same SRT principles.

5.3. Observable dimensions ('bit's) of digital nature ('it'): The Eq. (23) is the common definition for all systems irrespective of MMSS. Those systems are the constituents of whole digital nature where each of those systems, in Eq. (23), are ultimately appear as a product of (5+5) 10 inverse CIPs or co-ordinates or say 'bit's e.g. are 1 for m , 1 for v , 3 for s , 3 for s_u , 1 for t and 1 for t_u . Then, the digital nature or 'it' is nothing but a product of (5+5) mirror image or inverse 'bit's.

6. Probable magnitudes of UCs:

The magnitudes of all above UCs e.g. $k_1, k_2, k_3, k_4, k_5, k_6$ and k in Eqs. (2), (13), (16), (17), (21), (22) & (23) respectively can derive from some conventional magnitudes of the h, c , mean wavelengths of photons under visible light spectrum on whole EMS; and radius, de Broglie

wavelength & mass of a normal hydrogen atom in ground state of mass-energy. Then, approximate magnitudes for the $k_1 = 2.2099 \times 10^{-37}$ gm.cm, $k_2 = 1.1254246 \times 10^{-22}$ gm-cm/sec, $k_3 = 7.0025671 \times 10^{-26}$ cm², $k_4 = 1.31892659 \times 10^{-79}$ cm⁶, $k_5 = 1.38330215 \times 10^{-28}$ cm², $k_6 = 3.56616194 \times 10^{-33}$ cm²/sec and $k = 2.05331 \times 10^{-129}$ gm-cm⁹/sec.

7. Inference:

Digital limits of observation: A digital observer has no other alternatives apart from receiving and analyzing any digital or quantized messages from the object what it likes to observe. Therefore, the discernments of a digital observer about nature would be within a digital or quantized range of all micro to macro scales of systems or WCPs including the macro-most scale (the whole universe) in it. Then observer cannot find any non-digital or analog or continuum entity, which is hypothetically more fundamental than its digital messages. Hence, to such a digital observer (like us), the nature would be always perceivably digital.

Whether 'it from bit': To a digital observer (like us), the digital nature or 'it', in Eq. (23), is nothing but a *product* of (5+5) two inverse sets of CIPs or 'bit's, e.g. (m.s.t) & (v.s.u.t.u). Hence, that digital nature would be an 'it from bit'.

Whether 'bit from it': The CIPs or 'bit's can also be derived on the contrary from 'it' in same Eq. (23) by *dividing* inverse 'bit's. Therefore, in digital nature as well there would be "bit from it".

'It' is intrinsically inseparable from 'bit' or vice versa: In Eq. (23), all those CIPs or 'bit's in two inverse sets are intrinsically associated with all scales of micro to macro systems including universe or 'it'. Therefore, 'it' and 'bit' are never separable from each other within the range of the digital observation of nature.

Finally, if 'it from bit' then 'bit from it' as well: The digital nature or 'it' is a *product* of two sets of its intrinsic but inseparable 'bit's in Eq. (23). Conversely in same Eq. (23) those 'bit's are also *dividends* of 'it'. Therefore, 'it from bit' and 'bit from it' is just a depiction of the same digital nature on a mirror.

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References

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