

# Spiral Hashed Information Vessel

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**Abstract** - In this paper, it has been tried to provide an insight into the information system of Universe as a whole comparing it with the information system in our local reference frame of observables. With the conservation of information been carried out by the SU (1) gauge symmetry group of Universe, it explains how the same information is decoded in two different ways by respective information system mentioned above. It also provide with an introduction of different information processing methodology of the Universe and how their is loss of information by different dynamical changes in Universe including red shift.

**Index Terms** - Spiral, Universe, Quantum, Information, Particles, Symmetry, Processing.

## 1 INTRODUCTION:

In modern physics a wave of one hertz frequency is a single vibration of crest and trough with wavelength ( $\lambda$ ) equal to distance covered by electromagnetic waves per second i.e. **299792458 meters**. In our observing reference frame, we consider the frequency to be equal integral division of wavelength ( $\lambda$ ) defined above. But in reference frame constituting Universe as a whole, new wavelength ( $\lambda_u$ ) is a constant quantity defined by the value of Planck's length ( $l_p$ ) with value of **1.616199e-35 meters** described by

the mathematical expression  $l_p = \sqrt{\frac{\hbar G}{2\pi c^3}}$ . This in

Quantum Gravity is the length scale at which the structure of space time become dominated by quantum effects, and it is impossible to determine the difference between two locations less than one Planck's length apart. The Planck's area i.e. square of the Planck's length plays a role in black hole entropy. The value of entropy in units of Boltzmann constant is quantity  $\frac{A}{4l_p^2}$  where A is the area of Event Horizon.

## 2 PROCESSING OF INFORMATION:

In Quantum Spiral Theory [3] representing the reference frame constituting whole Universe (i.e. Universal reference frame), a wave of one hertz is a single energy cell (or potent heat bulb [2, 3]) with wavelength equal to Planck's length ( $l_p$ ). Thus the information being carried by the vessel of **1 MHz** in local reference frame of observable described by the wave on the length scale of **299792458 meters** can be viewed from Universal reference frame as combined behavior of **10e6** energy cells entangled together in a vessel of **6.187e-30 meters**.

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- The length of the information vessel (packet of information) containing the entangled (explained later) energy cells is given by  $\lambda_u = h l_p$ .

**The increase in frequency entangles the effect of more energy cells to provide joint effect.**

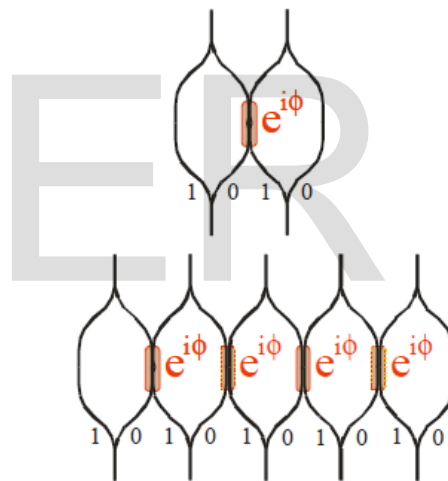


Figure 1: Information vessel carrying information via 2 and 5 entangled energy cells.

Thus, the information of Universe are contained in these entangled energy cells, with symmetry of the autocatalytic process of  $U(1) = SU(1) \times U(1)$  being measured in units of  $c^2$  as described in [1]. The Universe at its different sub-levels decodes this information by coupling these varying number of energy cells analogous to the bits in the modern computers which entangles in the sets of **32-Bit, 64-bit**, etc. Since **64-Bit** processor is faster than **32-Bit** processor in modern computers, similarly information vessel of Universe with large number of entangled energy cells can process information faster than less entangled ones e.g. **MHz is faster than KHz**.

**SU (1)** encoding of the Universe is the graveyard for all the information contained in the observable Universe within different cosmological systems. It recycles the residual information back into the formation of new Universe.

Thus the maximum possible frequency in Universal reference frame is  $n=1.85493e43$ . It defines the Scale of Universe with **SU (1)** symmetry and the observable universe and its frequency gets embedded to it. The Universe as a whole decodes and compiles the observables on its own scale defined above that means a 2 Hz particle is treated as just two energy cells inspite that they are consuming the complete set of n energy cells for just two wave cycle in local frame of reference for observables.

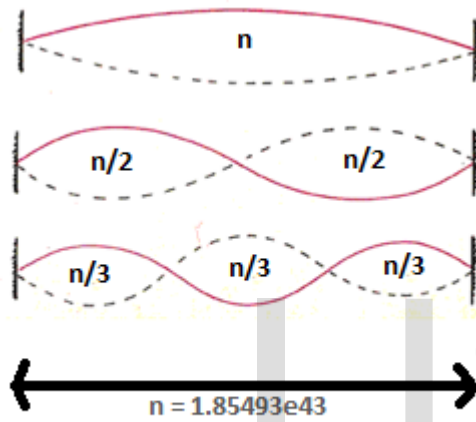


Figure 2: Illustration of consumption of Scale of Universe by wave cycles of different frequencies.

**Low observable frequencies of particles have loss of information through unnecessary consumption of Scale of Universe.**

**Red shift** shreds off the information to graveyard defined by **SU (1)** symmetry as travels through different systems.

**3 MATHEMATICAL DESCRIPTION OF SPIRAL HASHED INFORMATION VESSEL:**

Considering the Universe to be spanned by indefinite oscillators of size  $1.616199e-35$  meters given by:

$$\hat{H}\varphi(a, X) = (-H[a] + H[X])\varphi$$

$$= \left( \frac{\partial^2}{\partial a^2} - \frac{\partial^2}{\partial X^2} - a^2 + X^2 \right) \varphi = 0$$

From the geometrodynamics, we know that a **4-metric**  $g_{ij}$  decomposes into dynamical variables through Lagrange multipliers constraints:

$N \sim g_{00}$ : represents the lapse of information into miniscule black holes with the diameter of the event horizon equal to Planck’s length.

$N_i \sim g_{0i}$ : represents the shift of information along the entangled energy cells in the vessel.

The Planck’s Area is the area by which the surface of a spherical black hole increases when black hole swallows one bit of information [4]. These bits of information describe the order of magnitude of the oscillating strings that form the elementary particles [5] under the symmetry of **SU (1)**. The string scale (of String theory)  $l_s$  is related to  $l_p$  by the string coupling constant equivalent to the entanglement of energy cells as:

$$|11 \rangle \rightarrow e^{i\theta} |11 \rangle$$

The grainy nature of space time as observed through the WMAP (Wilkinson Microwave Anisotropy Probe) Background Radiation provides the observables for localized behavior of the energy cells on Universal scale. These miniscule grains are consequence of Heisenberg Uncertainty Principle which prevents the direct observation of precise location & precise velocity. The dimension of grain (i.e. Diameter equal to Planck’s length) is the minimum possible distance for tradeoff between the observables of location and velocity. The energy that would be needed to probe into the granularity of space and analyze the independent interaction of energy cells is known as Planck’s Energy with value

$$m(p) = \sqrt{\frac{c^5}{2\pi G}} = 1.22e19 \text{ GeV}/c^2 \text{ (per autocatalysis).}$$

It also must be noted from doubly special relativity that Planck’s length is observer invariant i.e. it is the minimum length scale corresponding to maximum energy scale of Planck’s energy at which energy cells can be autocatalysed. It also provides the interaction field for Quantum Gravity.

**4 MANIPULATING EXCITATIONS OF ENERGY CELLS TO EXTRACT INFORMATION:**

Ground state of vessel of  $n$  energy cells is given as:  $|\varphi^n \rangle = |\varphi(1) \rangle |\varphi(2) \rangle \dots |\varphi(n) \rangle$

The state of vessel with one excited energy cell can be described as:  $|\varphi^{n-1}\gamma \rangle = \sum_i |\varphi(1) \rangle \dots |\gamma(i) \rangle \dots |\varphi(n) \rangle$

The state of vessel with two excited energy cells can be described as:  $|\varphi^{n-2}\gamma\rangle = \sum_{i,j} |\varphi(1)\rangle \dots |\gamma(i)\rangle \dots |\gamma(j)\rangle \dots |\varphi(n)\rangle$

This goes on for  $n$  excited energy cells. To extract the information we take the linear combination i.e. resonating interference of two vessels with different excitation levels as illustrated below and probe it with laser with energy equivalent to Planck's energy:

$$|\omega(I)\rangle = \alpha |\varphi^n\rangle + \beta |\varphi^{n-1}\gamma\rangle$$

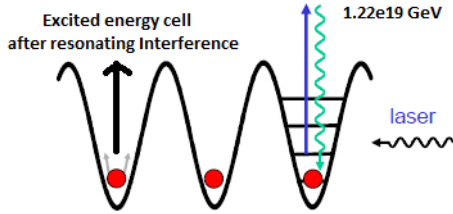


Figure 3: Illustration of probing the energy cell for information after the resonating interference. The red dot in the potential well illustrates an imaginary bit of information captured in the resultant energy cell after resonant interference.

### 5 QUANTUM MECHANICAL MODEL FOR ENERGY CELLS IN DARK POTENTIAL:

Divide the total system into "Dark Potential Ingredient" described by variable  $Q$  and "Formed Spiral Localized Potential for Elementary Particles" described by the variable  $q$ . The total system can be described by a stationary Schrodinger Equation for Quantum Gravity with the property of being timeless i.e. it contains the information 'from beginning to end' as:

$$H\varphi(q, Q) = E\varphi(q, Q)$$

Where,  $H = -\frac{\hbar^2}{8\pi^2 M} \frac{\partial^2}{\partial Q^2} + V(Q) + h(q, Q)$  with  $M$  is the mass effect acquired through formed spiral localized potential for elementary particles  $q$ .

Assuming annihilation of energy cells to be represented by:  $\langle \varphi(n) | \varphi(m) \rangle = \delta(nm)$  for each  $Q$ .

For 'Dark Potential Ingredient Part',

$$\sum_{n \forall \text{ all levels}} \left( \frac{P(nm)^2}{2M} + \epsilon \langle nm \rangle (Q) \right) X(n)(Q) + V(Q)X(m)(Q) = EX(m)(Q)$$

Where,

$\epsilon \langle nm \rangle (Q) = \langle \varphi(n) | h | \varphi(m) \rangle$  is the potential which breaks the wave function with  $SU(1)$  symmetry to extract the observables for energy cells i.e.  $|\varphi\rangle = \sum_{(x)} c(x) |X(n-1)X(n-2) \dots X(0)\rangle$  \* [the \* here is inner product between the terms]

$P(nm) = \frac{\hbar}{2\pi i} (\delta(nm) \frac{\partial}{\partial Q} - \frac{2\pi i}{\hbar} A(nm))$  is the quantization of mass effect acquired through formed spiral localized potential for elementary particles  $q$ .

$A(nm)(Q) = \frac{i\hbar}{2\pi} \left\langle \varphi(m) \left| \frac{\partial \varphi(n)}{\partial Q} \right. \right\rangle$  is the connection between the energy cells on Universal Scale and Local observable reference frame.

$\epsilon \langle nn \rangle (Q) = \langle \varphi(n) | h | \varphi(n) \rangle$  is the potential required for autocatalysis analogous to refresh of stored information by clock cycle of modern computers.

The integral for complete energy cells in the vessels can be given by:

$$\vartheta(n) = \int D\varphi \langle uv \rangle (x) e^{iS[\varphi(uv)]} \frac{2\pi}{\hbar}$$

The above equation provides the conservation of information inside the vessel where  $D$  is the diffusion coefficient for the information contained in energy cells with value 1 as described in [1].  $S$  is the timeless scattering matrix for information in energy cells that relates the initial and final states for energy cells during storage and retrieval of information contained in energy cells. The  $S$  is defined as the unitary matrix with symmetry  $U(1) = SU(1) \times U(1)$  connecting asymptotic spiral localized potential for elementary particles working as hash values for the information vessels.  $h$  is the metric of the observable world sheet.

### 6 CONCLUSION:

In this paper we look at conservation of invariant information contained in the  $SU(1)$  symmetry of the Universe [6] which is the terminal information as it is the residual of dying Universe and seed for the birth of Universe. In further studies we will be looking forward to find the probable resonance state for energy cells.

### 7 REFERENCES:

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