

The Quantum Field Model of Experiences, Responses and Thoughts

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ABSTRACT

Life is a series of experiences and responses woven in the chain of causality that builds the knowledge system in the universe, a complex system altogether. When we observe the subatomic system or the quantum field, the very act of measurement perturbs the quantum field within. The interaction produces change in the ground state of the quantum field. The mind field is treated as the quantum field as envisaged by various eminent scientists. The theory of perturbation helps us to compute the amount of energy change in the form of unitary time evolution operator followed by the Hamiltonian of the system. The Linear Response Theory helps us to compute not only the amount of energy responsible for the perturbation but to estimate the probable responses from such quantum field of the mind subjected to the perturbation. Thus the continuous series of measurements, perturbations and responses build the chain of causality within the mind field itself to perceive the continuity of the life. We will see in this attempt; the formulation of functionality of mind field part, identity of the observer, kind of observable, the process of realization of being experienced and null state of the mind.

Key Words: quantum field of mind, consciousness, sensations, perturbation, response, experiences, thoughts

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Introduction

As far as the mind field is considered, we need to analyze its mode of measurement causing perturbations and responses within it. We know that the five organs of the body are the measuring tools that the Mother Nature has created to survive. Thus these five organs or say body continuously measures the environment and keeps us alert about changes therein and self-educate by building a specific knowledge system within the mind-brain functionality. Mind field

along with the universal field of consciousness; possesses the weirdest qualities and potential in it to bring the sensations into its own ambit of awareness. Not only the amount of perturbation would be measured by the mind but also it would undergo its effects. Mind as an observer measures them as its own experiences. Such a series of experiences would further build knowledge system and chain of causality through the act of responsiveness to stimuli. Thus the act of measurement, the act of being perturbed and the act of responses are the fundamental functionality of the quantum field of the mind which makes it the vehicle of perception and cognition.

If we describe awareness as a creation operator/consciousness operator, then the absence of awareness would be the task of

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annihilation operator/unconsciousness in the quantum field of the mind. What does consciousness operator do in the awakened state of the mind? It plays the vital role of creating perturbations according to the superposition states of the mind in the form of desires, responses and feelings and bringing the causality of each of them in the ambit of awareness of the mind. Thus, what we inherit or sense with the help of our body is an act of measurement, which perturbs the quantum field of the mind.

The causality goes down to generate responses within the mind-field and we observe the displacement of objects in the Newtonian field of the universe that is influenced by the mind-brain functionality. Thus, when we perceive any object then our mind absorbs all the classical as well as quantum mechanical properties and attributes of such object and the central sense of "Self" or "I" observes the perturbations within its own field. This internal observation travels with the information through brain to analyze to create responses. The object does not enter in the brain with all its qualities but the conscious mind inherits all the qualities of the object and interacts with the brain to trigger further functionality. The mind would assume all the physical characteristics of the object being observed or would sense it along with its characteristics and would carry all such senses in its own field of awareness with the help of brain.

Therefore, I say here that the very act of observation or the measurement would make the mind inherit all the qualities and quantities of the object being observed letting it to bring them within its own field to create the quantum effects. The said quantum of action in its own field would create perturbations to describe it as sensations. I have conceptualized that the difference in perturbations would be observed/ measured within the mind field to undergo intermediate collapse to term it as an experience. The further analysis and decision making by mind-brain functionality would cause responses to maintain the chain of causality. And we can say that such a series of act of measurements, perturbations and responses would keep the Ground State changing till the end of life of sentient beings.

Based on the principles of Relativistic Quantum Field Theory (QFT), we will formulate the various actions and states of quantum field of the mind. This will help us to understand the quantum mechanical behavior of the mind field.

Super-field of Mind and Consciousness

As mentioned in the research paper published (Baaquie and Martin, 2005), we say that the fermions field $\varphi(t, x)$ represents the individualized state of the mind and the Boson field $\emptyset(t, x)$ represents the universal character of the consciousness. Therefore, we can say that these two fields will represent the super-field of consciousness of the universal mind as,

$$\psi(t, x) = \emptyset(t, x) + \varphi(t, x)$$

Let $\psi_a(t, x)$ represent the individual mind field linked with the individual brain to establish the mind-brain functionality within that will follow the principles of QFT.

Referring to the research papers (Hu and Wu, 2004; Bhutkar, 2015), the central sense of "Being Conscious" or "I" is maintained in the mind-brain functionality to play the role of an observer that not only observes or measures every physical sensation being received by the body but interacts with the memory unit to carry out various functionality with the help of mind and brain. I would like to describe this as a consciousness field of "I" or "Self" with full of awareness that works within the layer of mind-brain functionality. And every perturbation in the mind either due to external environment (world of physical objects) or the internal environment (memory unit) triggers this field to act as an observer/ doer/survivor as such.

The spin of mind particles does not create consciousness, whereas the spin mediates the sense of "Being conscious" through the awareness of "Self/I". When the mind is subjected to the external or the internal perturbation, the centralized sense of "Self/I" gets spread over the perturbed state of the mind itself. Mind engages itself in the process of measurement, perturbation, understanding and response etc. The outside person as an observer observes the acts of such person and confirms its status of "Conscious Being". Or the same person when comes out of any experience then it realizes that all its acts were possible due to the consciousness present in it. But this realization of "Being Conscious" itself becomes the perturbation in the mind to which we generally call as ego or the pride as such. When we say "I am conscious", the mind itself uses its own sense of "I" and with the role of an observer confirms its own consciousness. As soon as the internal observation takes place, the measurement of the



centralized sense of "Being Conscious" is taken and the response is generated through the above expression.

Now in order to apply the principles of QFT, we have an authentic equation of the wave function of the universal consciousness and we have authenticated the role of an observer who will spontaneously carry out the measurement to make all the relevant quantum effects to occur. Thus the role of the sentient being is now fixed on the ground of quantum mechanics and we are ready to analyze the functionality of the mind with the help of mathematical model based on QFT, leading towards the chain of thoughts and causality through sensations, experiences and the responses thereof.

Measurement in Mind Field

As the body of the sentient being is completely submerged in the bath of the external as well as internal environment, the body organs continuously transmit the sensations being received by them up to the brain. The stimulations generate fluctuations or the perturbations in the electromagnetic field of the brain which get sensed by the consciousness field of "I" as described by the Orch. OR theory (Orchestrated Objective Reduction Theory) established by Dr. Penrose and Dr. Stuart Hammeroff. The Orch. OR process helps mind to observe and bring all the perturbations in the ambit of its awareness to call them as the sensations and experiences.

As the mind field assumes or inherits the characteristics of the observable, the perturbations in the mind field are said to be the ensembles of all the characteristic information of the object which is responsible to stimulate the brain. The mind through its Self observes/measures and inherits all the characteristics of the physical object through all the 5 sensory organs of the body. Thus all the quantum actions take place in the field of consciousness which is inherited by the mind-brain functionality.

For example, the transmission of photons up to the brain is a prime function of the eyes but the vision is a function of subtle eyes made up of mind. Such subtle eyes actually see the object, and the very act of observation is attracted by the conscious "Self/I" generated out of the super-field of the mind. The similar phenomenon occurs in

case of the other body organs which cannot experience the sensations but just act as media to transmit them up to the brain.

Therefore, with respect to the physical phenomenon of being sensed and experienced, we say that all the physical characteristics of the physical object are in the form of quantum of energy exists in its own quantum field that is responsible to perturb the mind field of the observer. Therefore, we can say that the quantum state of the mind gets broken up into the superposition of Eigen-states of the peculiar qualities that would cause perturbation in the mind field. Let the observable possess the energy E_n with its probability amplitude as a_n (Beisert, 2013). Thus we can write the state of mind field at time "t" in space defined by "x" as,

$$\psi_a(t, x) = \sum a_n |E_n \rangle$$

Further, we can say that the mind would assume the energy E_n equal to the energy hold by the quantons coming from the observable with the probability of $|a_n|^2$. This quantum of energy will contain all the characteristics and attribute information of the observable that the mind will subsequently inherit (Fradkin, 2011).

Quantum States of Knowledge: Probability Density

When such ensembles of quantons transmit through the quantum field of mind, they carry with themselves the probabilities to manifest and undergo meaning mechanism through mind-brain functionality. The density of such ensembles is represented in the form of their probabilities. Therefore, before going to write the equation for the density matrix, we shall have to note that the quantum states already contain within them some probabilities. Once we express a quantum state on some basis, the coefficients for that basis determine the probabilities for finding the system in those basis states. However, these probabilities are not enough to describe all the possible states-of-knowledge. In general, then, our state-of-knowledge about a quantum system can be described by a probability density over all the possible states of wave function of the mind, $|\psi_a(t, x) \rangle$. We might refer to this probability density as describing our classical uncertainty about the system, and the coefficients c_n as describing the quantum uncertainty inherent in a given quantum state-vector. Therefore, in life we experience uncertainty and



we device number of options and alternatives for the problem to tackle with.

According to the Quantum Measurement Theory we can write,

$$|\psi_a(t, x) \rangle = \sum c_n |n \rangle$$

Where c_n are the complex numbers, and n is a set of vectors.

We say here that the complete state-of-knowledge of a quantum system of mind is a probability density over all the possible states for most purposes that could be used for more compact representation of this state-of-knowledge. This compact representation is said to the density matrix. It was devised independently by von Neumann and Landau in 1927 (Atmanspacher, 2004).

$$\rho = \sum p_m |\phi_m \rangle \langle \phi_m|$$

Where p_m is probability of system in its state “m” and $|\phi_m \rangle$ represents the state of m^{th} observable.

Now considering the von Neumann’s projection postulate as a mathematical tool for describing measurement,

$$\rho \rightarrow \rho' = \sum_{j=1}^{\infty} \langle o_j | \rho | o_j \rangle . P_{o_j}$$

Where, ρ is the state of the quantum field of the mind before measurement and o_j are the Eigen-states of the measured observable. We say here that an observable “o” with Eigen-states o_j and the state ρ of the quantum field of the mind will be projected with P_{o_j} onto one of the basis vectors of a specific configuration of such observable that appears in the mind field. The transition to a particular Eigen-state o_j through ρ' is called as collapse of the wave function, which leads to the meaning mechanism as such.

Transition Amplitude: The Period of Being Sensed

For every change in the quantum field, we observe the change in the Hamiltonian of the system through a specific mode of transition. Similarly, let the mind field possesses its own Hamiltonian H and upon observation and interacting with its own field, let it represents its interacting part of the Hamiltonian as H_{int} .

This interacting part of the Hamiltonian H_{int} creates the transition in the state that alters

the properties of the mind field. Let the Hamiltonian H_0 represents the initial state of the mind field at time $t = t_0$. Referring Schrödinger’s equation [7], we can write,

$$|\psi_a(t, x) \rangle = e^{-iH_0 t} |\psi_a(t_0, x) \rangle$$

The transition amplitude of the system at time t would represent the probability of the mind state to transit upon any perturbation caused due to the transmission of quantum of information through its own quantum field. Thus the transition amplitude of the system at time t is given by,

$$\langle \psi_a(t, x) | e^{-iH_0(t-t_0)} | \psi_a(t_0, x) \rangle$$

Using unitary time evolution operator, the transition amplitude is represented as,

$$\langle \psi_a(t, x) | U(t, t_0) | \psi_a(t_0, x) \rangle$$

Perturbation: The State of Being Sensed

Here, we have been modeling the quantum mechanical process of being sensed and being experienced based on the QFT formulation. We saw that the quantum field of mind with its own internal observer as “Self/I”, observes every quantum mechanical process that is happening within itself. The quantum field of mind possesses its own potential to undergo the quantum effects due to the transmission of quanta of the observable through the 5 sensory organs of the sentient beings and a peculiar behavior that the quantum field is subjected to.

Referring to the above equations of transition amplitude, we can write the interacting part of the Hamiltonian at time t ,

$$H_{int} = e^{-iH_0(t)} H_{int} e^{iH_0(t)}$$

This interacting part of Hamiltonian will lead mind field to cause perturbation therein. Thus we can also write the above equation in terms of the changed potential of the state of the wave function as,

$$V_{int}(t) = e^{-iH_0(t)/\hbar} V e^{iH_0(t)/\hbar}$$

Such perturbation that spontaneously occurs within the quantum field of the mind is sensed by the mind-brain functionality. The entire process of being observed/ measured and perturbed is witnessed by the centralized consciousness character of the mind-field “I”. By virtue of the supreme sense of consciousness, it



brings the perturbations in its own ambit of awareness. The centralized consciousness character of the mind-field "I" measures the sensations being received. As this quantum of energy change holds all the characteristic information of the observable, and as the mind field possesses the potential to inherit those characteristics, the sensations are brought in the ambit of awareness and acknowledged by the mind-brain functionality.

The spin-mediated mechanism spreads sensation of "Being Conscious" through the mind-field (Hu and Wu, 2004). Now, as we have seen that all the material sensations create perturbations in the quantum field of the mind, the question arises about the effect of the perturbations due to the supreme sense of consciousness. Here, I would like to illustrate that the quantum field of mind inherits such a supreme sense of consciousness through the spin-mediated mechanism upon attaining the perturbations to let the unique sense of "I" appear within the quantum field of mind. Such a peculiar state of "Being Conscious" is said to be its field of consciousness as such. To support this illustration, I say that the supreme source of consciousness is responsible for the transmission of its sensations through quantum field of the mind that generates the permanent state of perturbation of consciousness within. Such a permanent perturbed state of the quantum field of mind is said to be the field of consciousness. There upon the centralized virgin sense of "I" witnesses every event of perturbation due to the material sensations to acknowledge the event of awareness as such. Therefore, the awareness is said to be an event that is being perceived on the background of the field of consciousness as such.

Thus, such a perturbed state of mind due to the spin mediated mechanism of consciousness creates a centralized, purest and supreme sense of "Being Conscious/I" that is common for all the living things. Such a supreme sense of "I" does not carry any role of Self/I-ness/Ego/Pride/Esteem etc. with it, unless it involves or indulges in the act of giving responses to the material senses.

The sensations emerged from the matter/objects/subjects are inferior to that of sensations emerged out of consciousness. In the perturbed state of the mind due to sensations from matter/objects/subjects, its field holds numerous of attributes and characteristics of the five senses that are measurable. Mind with its

"Self/I" can measure any one of the sensations at a given instance in the light of consciousness. The mind particles acquire certain momentum and thus such a perturbation creates a feel of being experienced. The mind perceives the virtual reality within its own field as an event of experience. The apparent reality of classical world is converted into the form of its virtual reality of quantum effects during the perturbed state of the mind. Thus, it is a sheer delusive act on the physical plane that we perceive the object or the subject in our life. The mind cannot get the complete experience of the object and subject at a given instance and hence it undergoes thirst and keeps generating instincts within to satisfy it. Therefore, the state of perturbation is said to be the source of instincts, thirst and the regime of virtual reality.

The observer or the "Self" reserves its choice whether to observe the perturbation due an external event happening in front of it on the physical plane or to observe the perturbation due to the internal event generated with the help of superposition state of an earlier event retrieved from the memory unit. Thus, the quantum effects have given us tremendous potential to overcome the limitations of physical reality.

Response: The cause of emergence of "Self"/"I-ness"

Now as we know that the quantum field has its own characteristics to undergo the effect of perturbation upon measurement, it also generates responses from within. Similarly, due to the transmission of quanta of information of the objects and subjects through the quantum field of the mind, it also generates responses from within spontaneously. I am emphasizing here that the mind is a quantum field and is witnessed by its self-generated supreme sense of "I" as an effect of spin of its quanta within its own super field. Moreover, I represent here that it is possible to portray the mind-brain functionality using the mathematical model based on QFT.

Now I say here that the perturbation is nothing but a meaningful profile of the quantum field that appears within itself. Such appearance with all its characteristics and attributes forms a picture of apparent reality being perceived by the sentient being. By applying the concept of picture operator, we say that all the physical information of interest is contained in matrix elements of Schrödinger picture operators $\hat{O}(t, x)$ that are



dependent on time. We can say that these operators represent the consciousness operators to operate on the mind field. This can be expressed as,

$$\langle \hat{O}(t, x) \rangle_{int} = \langle \psi_a(t, x) | \hat{O}_s(t, x) | \psi_a(t_0, x) \rangle$$

Where, $|\hat{O}_s(t, x)|$ represents the picture operator and that appears before undergoing interaction upon perturbation. The first order change in the matrix element arising from an external perturbation can be expressed in terms of the Heisenberg operators of the interacting but unperturbed system. In particular, if $\psi_a(t, x)$ and $\psi_a(t_0, x)$ both denote the normalized ground state $|\psi_a(0)\rangle$, the linear response of the ground state expectation value of the operator is given by,

$$\delta \langle \hat{O}(t, x) \rangle = \langle \hat{O}(t, x)_{int} - \hat{O}(t, x) \rangle$$

OR

$$\delta \langle \hat{O}(t, x) \rangle = -\frac{i}{\hbar} \int_{t_0}^t dt' \langle \psi_a(0) | [H_{int}(t', x') \hat{O}_s(t, x)] | \psi_a(0) \rangle$$

Thus the magnitude of the response from the perturbed mind field would indicate that the quantum of energy is utilized to create the internal response from the mind field. Such an internal response would then trigger the chain of thoughts leading to the physical movements to describe them as responsiveness to stimuli.

The mind in the background of the supreme sense of consciousness perceives all other material senses. The observer in the mind is nothing but the Self that maintains the personality of the sentient beings through its "I-ness". The "Self" or the feeling of "I-ness" is the permanent response towards the supreme sense of "I" maintained in the perturbed state of supreme sense of consciousness within the mind field. Such a supreme-most response in the form of Self/I-ness, plays its permanent role of observer of all the other perturbations caused by the material sensations that are of lower intensities. Such responses based on five senses are general and common in all the living things. Thus, the observer/doer/survivor/consumer that plays the role of conscious living thing is nothing but the outcome of the quantum mechanical process of responding to the material senses on the background of supreme sense of consciousness "I". It experiences its own

consciousness through the quantum mechanical process of measurement, perturbations and responses through the body as a medium in between. Such an indirect experience of consciousness (I-ness) is not said to be the virgin experience of being conscious, because the quantum mechanical cycle is applicable to only material sensations that are conveyed through the bodies of living things as such. Therefore, such an indirect sense of being conscious creates Ego/Pride/Self/I-ness/Esteem to role as an observer either on its quantum plane of reality or as an experiencing agent of the material universe on the physical plane of reality.

The supreme sense of consciousness is beyond all known sets of senses and incomparable. The spin mediated event of consciousness not only spreads its divine and supreme sense but enlightens the mind field to perceive other material senses. Therefore, the supreme state of perturbation due to such a supreme sense of consciousness cannot be measured by the Self/I as such. The quantum effects of supreme sense of consciousness that appears spontaneously in the form of its two byproducts. They are the "Perturbed State (Field of Consciousness with centralized supreme sense of "I")" and the "Response State (sense of Self/I-ness)". Moreover, if Self/I would try to measure it, then it will get immediately dissolved in its own source of consciousness (Figure 1).

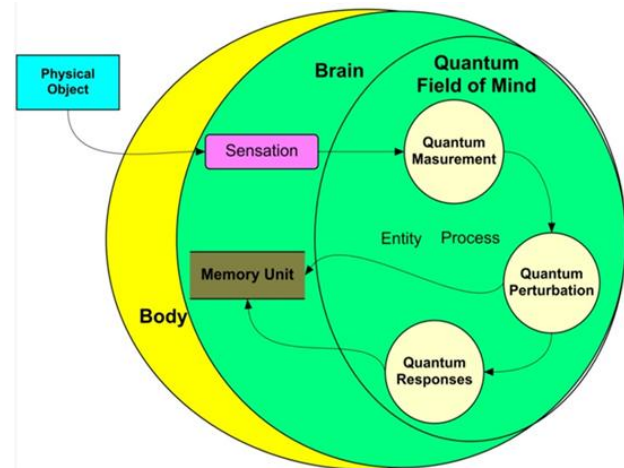


Figure 1. Process of sensation.

MPRM Cycle: The Virtual Thought Machine of the Mind.

The Measurement- Perturbation- Response - Measurement (MPRM) is an unending spontaneous cycle of actions in the mind field.



The energy of fluctuation or the perturbation gets utilized to maintain the proactive status of the mind to spontaneously create the chain of thoughts. This perturbed state of the mind differentiates the mind into number of pieces of superposition states woven into the chain of thoughts. The centralized sense of "Self" roves in these superpositions of various thoughts creating further perturbations and thus maintains its own identity through the differentiated status of the mind field. The act of getting submerged into the experience to cause perturbation and then coming out of it to measure it and give responses, create a kind of potential that maintains the ego or the pride of the sentient beings through its very act of an observer. Thus, the mind field itself tries to maintain its own state of awareness creating numerous potential probabilities, which are sheer delusions of themselves, because none of the objects or subjects actually enters into the mind but their mere sensations create numerous of superposition states within its own wave function as a virtual reality. This is the source mechanism of the chain of thoughts that is spontaneous in nature.

The Self-oriented exhibition by the sentient being is a consequence and combined effect of desires, tendencies, knowledge and intelligence due to the sensations being received from the universe through the interactions between the mind and the brain are called as responses. The potential difference in quantum of energies due to the event of experience or the knowledge creates a subtle electromagnetic field along with biochemical reactions in the brain. This creates triggering mechanism to occur decohesion state followed by the collapse effect in the form of physical responses. By the very act of responses, we see changes in the universe from its subtlest form of quantum world to the gigantic form of the classical world. The response gives momentum to the chain of causality and compels sentient beings to act to displace the objects in the universe. Classical physics is a science of displacement of the objects, but it cannot be described as a science of causality. Thus, we see here how the seed of chain of causality is hidden in each of the thoughts that have been woven in every event of the MPRM cycle.

The changes we see on the material plane; are not due to the changes in the position of particles therein, but they are due to the reasons behind their displacement by virtue of all potential probabilities that the wave function

holds. Such potential probabilities are the outcome of the various quantum effects that have been taking place in their own quantum field again due to the act of measurement of responses. Thus, every such event of experience is the difference in the sensations that are being sensed by any one of the five sensory organs at a given moment. Therefore, we say here that the potential difference between the perturbations hold potential to create and maintain the chain of causality in the universe woven into the fabric of thoughts. Such a chain of causality contains tremendous potentialities to manifest by the sentient being upon its observation. Therefore every bunch of cycles of Measurement-Perturbation-Response-Measurement (MPRM) becomes an element of thought and the source of causality. Such bunches of MPRM cycles or thoughts possess potential to act as a "Cause" of some other chain of causality and at the same time they possess potential to act to carry out consequential "Effects" in the form of a chain of causality. However, we shall firmly anchor our self-awareness in the understanding that we are the source of consciousness and thus we are all always aloof from all such a virtual quantum regime of the mind.

The MPRM cyclical process in the quantum field of the mind helps to underline the apparent reality of the surrounding world through the virtual nature of quantum effects. Such a transformation and transmission of the quantum of energy through the quantum field of the mind creates trajectories by virtue of this cyclical process. Such trajectories of the quantum of energy are the ensemble of the quantons of varied characteristic and attributes that achieves momentum due to each of the events of the observation/measurement within MRPM cycle. Such trajectories of various characteristics and attributes are the building blocks of the desires, intentions, aspirations, tendencies, emotions and feelings in the form of a continuous flow of the thoughts. This core mechanism exists in the "Virtual Thought Machine (VTM)" of Quantum phenomena. Therefore, I say that the awakened state of the mind is said to be a "Virtual Thought Machine". As conscious-observer, our mere observation is responsible to let such MPRM cycles and functionality of the VTM occur spontaneously in our mind-fields. Therefore, we can neither claim the ownership of such mechanisms nor claim the ownership of desires, tendencies, feelings or emotions. We are the



bystander of the flow of thoughts that we have allowed to let flow through the mind-brain functionality.

Quantum field of mind is very vibrant, unstable and sensitive and therefore it is complex in nature. The waves of potential probabilities create thought-chains in the mind. Those thought-chains themselves become the cause of decohesion followed by the collapse effects in the form of responses.

While practicing anything, the lot of changes takes place in the mind- brain functionality. The well-controlled responses out of the specific energy hold by the mind- brain functionality, fix the probability of giving the same type of responses in future. Till the time the living things do not achieve control on their responses, the conscious mind selects the responses out of the pool of potential probability from the universe, that is independent of space-time and common to all living things.

Ground State

The quantum field theory helps us to define the state of the quantum field that possesses specific potential probabilities to exhibit its effects. It is proven by the scientists that there exists a quantum super-field of the universe, which possesses the Null State or void as such. All sentient beings at a given era or the time of the universe live in a specific Ground State that proves to be greater than the Null State of the universe as such. Such a Ground State is a function of the mind field, which has tremendous potential to exhibit its potential probabilities through the cycle of "Measurement-Perturbation-Response-Measurement" as such. Now we will see its mathematical formulation as given below.

Referring to the research paper (Baaquie and Martin, 2005), let the human mind be denoted by a state as $|m\rangle$. Mind is said to be a bunch of numerous of superpositions, which cause perturbations therein. Let's categorize these superpositions into desires, tendencies and feelings. I have considered these three fundamental functions of the mind because they form a continuous cycle of creating desires then tendencies to follow them, act on them and after either success or failure mind expresses its feelings. Such feelings or opinions again become instinct to create new desires and so on.

Now let the state vector of the mind; $|m\rangle$ represent these fundamental superposition states of the mind as,

$$|m\rangle = \sum_{i=1}^n c(i) |Desires\rangle + \sum_{j=1}^n c(j) |Tendencies\rangle + \sum_{k=1}^n c(k) |Feelings\rangle$$

Where the coefficients $c(i), c(j)$ and $c(k)$ represent the

Then the mind state at time "t" in the space position "x" after several generations of the same species would be defined as,

$$|m(x, t)\rangle = a^\dagger(x, t) |G(t)\rangle$$

As energy comes in discrete packets, we can say that the thoughts also resembles with such bunch of numerous of small energy packets " $n\epsilon$." We can represent this energy packet $n\epsilon$ in terms of ground state as given below.

$$|Desire(n)\rangle = [a^{\dagger D}]^n |G(t)\rangle$$

In this $a^{\dagger D}$ is consciousness operator for desire. Similarly, $a^{\dagger T}$ and $a^{\dagger F}$ are the operators for tendencies and feelings respectively. Thus, the mind state would be rewritten as,

$$|m\rangle = c1 * [a^{\dagger D}]^n |Desire(n)\rangle + c2 * [a^{\dagger T}]^n |Tendency(n)\rangle + c3 * [a^{\dagger F}]^n |Feeling(n)\rangle$$

Where, $c1, c2$ and $c3$ are the complex numbers associated with the state of desires, tendencies and feelings respectively to specify their importance/priorities.

As $|m\rangle$ is normalizable, let us assume its Hilbert space as M for the individual sentient being. Let this $|m\rangle$ be called as a virtual state or the superposed state of all possible states of the mind. The state of mind $|m\rangle$ represents its potential state as well as virtual state. The free will with due decoherent state would change the state of the mind from its virtual to the physical as such. Such decoherent state will take place either due to the measurement by the environment or by the conscious self.

Now let's consider the conscious mind field ψ_a comprised of creation operator as a^\dagger covering all the conscious acts of the person and



annihilation or destruction operator as a responsible for the unconscious state of the person. Thus before the existence of the sentient beings the associated vacuum state must be $(x, t)|\Omega\rangle = 0$, where $|\Omega\rangle$ is the vacuum state of the conscious mind field.

Now as the conscious acts would have been started after the first incarnation of sentient beings on the planet, such a ground state would have been modifying constantly throughout the evolution of the species. Let's assume ground state of an individual sentient being $|G(t)\rangle$ at time "t" elapsed after the first incarnation. To define the Ground State $|G(t)\rangle$, we will consider an evolution operator as $U(t, \delta t)$, where δt is a smallest interval of time. Thus the ground state at time "t" would be,

$$|G(t)\rangle = \prod_{t=0}^t U(t, \delta t) |\Omega\rangle$$

Thus we can say that the ground state of mind after time "t", $|G(t)\rangle$ must be greater than that of the vacuum state of the mind field $|\Omega\rangle$.

Experience: Intermediate Quantum Collapse State within the Mind field

Here, I would like to introduce this new concept of quantum collapse within the mind-field itself. Up till now we have seen how the sensations are brought into the ambit of awareness and sensed by the centralized conscious character of the mind-field "Self/I" in the light of consciousness. Now we will see the mechanism of the "Experience" or "Realization" by virtue of "Intermediate Quantum Collapse State" within the mind field. The collapse state of the wave function is a manifestation of one of the potential probabilities that is being held by it. But in the case of quantum field of mind wherein the "Meaning Mechanism" takes place, it shall have to undergo the "Intermediate Quantum Collapse Effect" to describe it as "Understanding" OR "the realization of the situation" OR "bringing the sensations in the field of its awareness" OR "the process of awareness" in the usual sense. The perturbed state of a quantum field of mind is said to be the field of consciousness that witnesses every event of perturbation due to material sensations to call it as awareness as such. Therefore, the awareness is an event that is perceived on the background of the field of consciousness as such. Thus the process of "Being

conscious about" OR "The Process of Understanding" OR "The Process of Realization" OR "The Process of Being Experienced" is described here as a "Intermediate Quantum Collapse Effect" in the perturbed state of the conscious mind (Field of Consciousness).

Generally, an "experience" is said to be a qualitative term. When we say, "Today is cooler than yesterday." We mean that the sensation from the climatic condition received on yesterday was warmer than that of today. Here the consciousness character of the mind field-"Self" interacts with the memory to retrieve the latest relevant sensation as such. Thus, we can say here that every perturbed state of the mind field is a snapshot of the event of sensation and is stored along with its all characteristics in the memory unit of the brain.

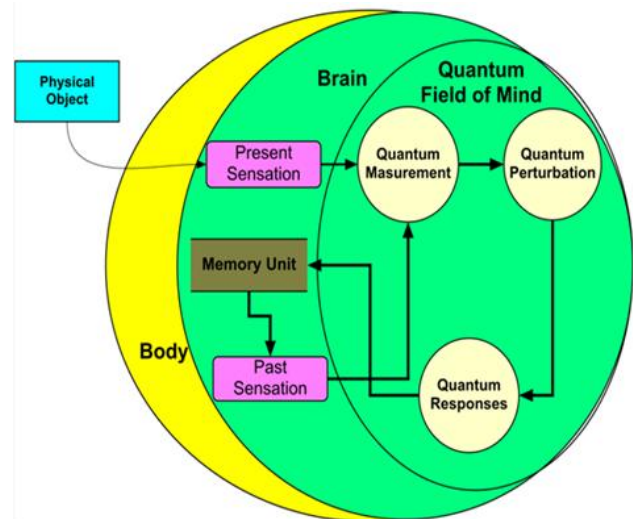


Figure 2. Intermediate quantum collapse effect.

The centralized consciousness character of the mind-field "Sel/I" compares the difference in the successive similar and comparable sensations that were the perturbations in the mind field and assumes it as an experience. I describe this process of understanding of the difference in two different perturbations as an "Intermediate Quantum Collapse State of Realization" within the mind field. This meaning mechanism is then followed by the response in terms of the sense of being acknowledged of that particular experience in the ambit of its own awareness. Let's write the difference in two different perturbations as,

$$\delta V(x, t) = |V_{int}(x, t') - V_{int}(x, t)|$$



Where, t' is a time at which another similar kind of perturbation occurred in the mind field. The difference in these two perturbations then itself - becomes the observable. Now if the ground state would be, $|G(t)\rangle$ as mentioned above, then the action of the weak perturbation would be given as,

$$\langle G(t)|\delta V(x,t)|G(t)\rangle \rightarrow \langle G(t)|U(t)^{-1}\delta V(x,t)U(t)|G(t)\rangle$$

The linear response of the system to the internal perturbation would be represented as the lowest order change in the expectation value,

$$\delta \langle G(t)|\delta V(x,t)|G(t)\rangle = i/\hbar \int_{-\infty}^t dt' \langle G(t)|\delta H_{int}(t')\delta V(x,t)|G(t)\rangle$$

It is given in the terms of the ground state expectation value of the commutator of the perturbation and observable. As $t > t'$ the above equation obeys the causality. In this analysis the loss in the action of retrieval and interactions in the mind-brain functionality is neglected. Thus on the intermediate collapse at time t' , we get the state of wave function of the mind at the n^{th} state of observable,

$$|\psi_a(t',x)\rangle = c_n|n\rangle = \delta V(x,t)$$

Thus, as a usual phenomenon, the entire mind gets flooded with the specific kind of experience $\delta V(x,t)$ as such.

Therefore, we can say that every act of internal observation of the stages such as measurement, perturbation, response and measurement (MPRM-cycle) creates a cyclic process in the mind field. Every measurement is measured in a cyclic manner to create numerous of perturbations, every perturbation is measured to create further responses and every response is measured by the mind field to create further measurements in a cyclic manner number of times till the mind reaches to its satisfaction level. The beauty and strength of this MPRM cycle is that this happens in a millionth of a second that is not distinguishable for the mind and hence we feel continuity in life. The mind can further underpin with such a powerful tool of the cycle of MPRM to that level of its perception till it has the ability to measure the differences between "What was expected" and "What have been achieved?" Therefore, when we conclude that we got the pleasure of being satisfied, then it is a sheer delusion because it has been created due to our

inability to further go down beyond at the quantum level to measure the perturbations and responses thereof. We can describe this as a kind of "Quantum Mechanical Reduction Process" of acquiring of knowledge of satisfaction and pleasure as such. If we go further down the line; we will realize that the difference between the numerous and varied experiences and the causality cropping out of this cyclical process builds the entire knowledge system within; which is the complex phenomenon to formulate.

Generally speaking, the consciousness in the domain of the universe (comprised of all the classical as well as quantum regimes therein) is a fundamental cause of a collapse effect, which brings the material manifestations in the ambit of awareness. However, within the domain of the mind, all the superpositions those are created in the quantum field of the mind, they undergo decohesion effect due to the inner observation by the Self/I. The further effect of such decohesion due to consistency in the observation and physical efforts leads towards the collapse of a wave function either in the form of experience or the in the form of knowledge that can be described as an "Intermediate Quantum Collapse-IQC". The effect of IQC is nothing but bringing the meaning of sensations, experiences, knowledge in the realm of awareness and its understanding. Therefore, this IQC effect can be described as the effect of intelligence as such.

The observer undergoes the change in its mind energy due to every new experience being received by it. The consistent observation, not only changes the energy level of the perturbed state of the experience, but that of the observer also. When this energy wave of experience assumes its decohesion state, it starts manifesting as a meaning and also creates a potential to substantiate it. This can be described as the waveform of meaning. The collapse effect of this "Meaning-Wave" brings the meaning in the ambit of awareness and this is said to be the "Knowledge." Thus, the conscious mind is responsible to create a meaning wave to understand the universal phenomena that establishes the several knowledge systems.

This intermediate quantum collapse effect is similar to the Orchestrated Objective Reduction as described by Dr. Roger Penrose and Dr. Hammeroff. The feeling of sensations is a continuous process that keeps us in the paradise of being aware of in the field of consciousness.



The number of options is nothing but a number of superpositions in the mind. The matured and wisdom based approach brings any one of those superpositions in their decohesion states. The sudden action will never create superpositions and in such case, one has to face the unwarranted situation in its life. Creating as many superpositions in the mind as probable options for the responses, studying them carefully with intelligence and wisdom within the least time and choosing the right one with precision and accuracy indicates the smartness and higher intelligence quotient of that person.

Another important observation that I want to mention here is about missing the awareness of paper, printing styles and the printed words while in understanding the meaning of the matter that has been printed on paper. Thus, when we lost ourselves in the understanding of the meaning through Intermediate Quantum Collapse (IQC), we never notice the material appearance of the page, printing styles and the structural form of the book, which was a material source of meaning. This process of understanding of the meaning is nothing but the Intermediate Quantum Collapse effect that takes place in the material world. Thus, the only conscious mind establishes the interrelationship between these two phenomena of classical appearance and its quantum mechanical process of understanding. Now, when we come across misprinted words or missing words, we leave aside the flow of meaning and look at the material form of the book.

In the above example the person was taking the indirect or the witnessing experience of the consciousness momentarily forgetting its body. However, in Samadhi or the deep meditation one can directly experience the Virgin Consciousness leaving aside permanently the material awareness of its body.

The quantum energy level of the mind field before getting oscillated due to the external sensations and that of after getting oscillated due to the sensations; differ. This potential difference is measured by the mind to call it as an experience. Thus, the measurements of the superposition state of the sensations being received undergo decohesion and collapse effects within the brain by merely an inner observation by the Self i.e. the conscious state of the mind.

It is next to impossible to exist any of the experiencing process without measurement

carried out by the sentient beings. Every sensation is sensed by the mind-brain functionality in the field of awareness. Thereafter, on every step of such rotating cycle of sensations, experiences, thoughts, analysis, decision, orders, implementation and conclusion, etc., the measurement of their effects is expected. Thus, every thought is brought into the realm of awareness during the process of understanding as consequence of MPRM cycle. Therefore, we can say that the conscious observer as a form of the universe measures the transformation and transmission of the universal energy and assumes the reality of life through the various quantum effects of experiences and knowledge with varied functionality.

The numerous of types of objects and their numerous of mixtures/combinations create a kind of diversified physical reality in the world. The sentient being by virtue of the potential of its brain and the mind measures this diversity and categorize its information at its every stage of cycle of transformation such as from sensations to the conclusions. Thus, at the subtlest level, the quantons are responsible for transmission and transformation of energy, which create the further effects of moral values, culture, tendencies, potential, desires, passions etc. within the mind.

Null State

Mind field cannot easily get escaped from this cycle of “Measurement-Perturbation-Response-Measurement” unless it stops giving responses in the form of the measurement or the observation. During meditation, the concentration of the mind on the sense of “Being conscious-I” starts with the creator operator a^\dagger and consequently the concentration of annihilation operator a also start to balance the state of the mind. During deep meditation, the “No-Perturbation” state is preserved by both these operators. At one moment, the potential of creator operator and the annihilation operator balances the mind field and makes it neutral to reach up to the ground zero state during practice of Yoga. Therefore, I take liberty to say that the mutually opposite spins of the mind particles would balance their neutral state. At this very moment; the sense of “Being Conscious” or “I”, dissolves into the source of consciousness. Thus if someone goes in search of virgin “I”, he/she never get hold of it, but on the other hand he/she dissolves its material



awareness into the source of consciousness. Thus, our fundamental identity is "Consciousness" and not the mind or body per se. The null state of the mind field can be expressed as below,

$$\langle \psi_a | \psi_a \rangle = \langle \Omega | a \cdot a^\dagger | \Omega \rangle = 0$$

Null state is not normalisable and therefore on the background of principle of non-zero probability of Quantum Mechanics, it has to be interpreted appropriately. During the practice of Yoga, such a null state of the mind is described as the "Experience of Zero". As far as the ground state is considered the "no-excitation" state would be represented as,

$$c|G(t)\rangle = 0$$

It is said that during the practice of Yoga, the self-awareness of the disciple travels to and fro from the classical state to the quantum state of the mind. He/she can acquire such command on the entire quantum mechanism of the mind that he/she can easily toggle between these two states. He/she at his/her own will either dissolve his/her "Self/I" into the consciousness or to retrieve back to rove with the mind field.

Conclusions

With this we can conclude;

- i) The Quantum Field Theory establishes the model of functionality of the mind through its various concepts of measurement, perturbation and response that works out the process of experiences and responses along with the chain of thoughts to justify the causality in the universe.
- ii) The observer consciously retrieves the information stored in the memory and undergoes

quantum behavior to create experiences. Such Quantum Reduction Process of information create an event of experience within fraction of a second, otherwise an event of experience does not exist independently. This entire process of realization is being carried out by the mind-brain functionality within its own regime and therefore it can be described as an "Intermediate Quantum Collapse Effect" of the wave function related to the interaction of the information stored in the memory unit and that of recently perceived by the mind-brain functionality.

iii) All the sentient beings possess their sense of "Being Conscious-I" through a perturbed state of mind-field due to the spin mediated mechanism that create supreme sense of consciousness. The spontaneous response generated within the mind-field to such supreme state of perturbation gives birth to the character of I-ness / Self / Ego / Pride / Esteem that plays the role of an observer/Doer/Consumer/Survivor.

iv) There are two types of observable, one the physical objects in the external environment of material world and another is the information stored in the memory unit of the brain as an internal environment of quantum regime.

v) The Null State of the mind field can be achieved with the practice of Yoga and deep meditation even though it cannot be easily interpreted on the background of principles of quantum mechanics.

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