

## Novel Design Rabi Oscillation System for Human Quantum Life Detection Probe

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**Abstract:** Rabi oscillation of particle (photon) can be generated by light propagating within a micro-optical ring resonator. The connection between particles and projection parameters can be distributed across time and space when they are in their quantum coherent state, in which the quantum life can be established via the substance of the quantum field, where the massless particle (photon), i.e. thought/feeling can be projected and the measurement formed. By using the Rabi oscillation probe, the neuron projection parameters such as Čerenkov radiation, levitation, remote viewing, psychics and supernatural power can be projected and measured. Furthermore, when the massless particle, i.e. thought/feeling speed is greater than the group velocity, the cold body behavior under the adiabatic process is formed and survived, in which the relics can be obtained after death by the cold body phase transition, where the different forms of amorphous materials are constructed and obtained.

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**Keywords:** Quantum life; Rabi oscillation; Supernatural power; Machine consciousness; Metaphysics

### 1. Introduction

In Buddhism, the quantum state in human can be formed after the deep meditation, which is known as enlightenment, where mind or spirit can be distributed across time and space when they are in the quantum coherent state (McFarlane, 2002; Schmidt, 1997; Rescher, 2006; Hawley, 2006). However, the paradox of such a state is involved, where only one in each pair can be observed. Albert Einstein and his colleagues designed a thought experiment intended to reveal what they believed to be inadequacies of quantum mechanics, which is known as EPR paradox (Einstein, 1935; Hall, 2013; Blasband, 2012), where the physical quantities come in pairs which are called conjugate quantities. Examples of such conjugate pairs are position and momentum of a particle and components of spin measured around different axes. When one quantity was measured, and became determined, the conjugated quantity became indeterminate. Heisenberg explained this as a disturbance caused by measurement. Similarly, consciousness is the paradox of sub-consciousness. The quantum life model is proposed to describe the mechanisms in living system, where they are coupled by the properties of the quantum field, in which the unified explanation of the full range of human experience can be realized (Hagan et al., 2002; Beck & Colli, 2008). Quantum field theory is a combination of three substantial elements of physics-quantum

mechanics, special relativity and classical field theory (Igor & Juan, 2009), which is pointed out that particles and atoms are connected and bound by the basic element known as string (McMahon, 2008), where all matter abides by the rules of string theory. In which the connection of strings can generate forces and fields throughout universe (Wuensch, 2003). Human spirit, thoughts and feelings of human are the massless units similar to photons in the quantum field, which can be accounted for the non-material parts of the human experience. In principle, micro-tubes in our cells, particularly in our neurons provide form and movement in cells, where the fold configurations of the protein molecules that make up the micro-tubes oscillate between a quantum coherent state and a collapsed, material state, which can transfer information back and forth between the hologram in our minds and the hologram of the quantum field.

Rabi frequency is the frequency of oscillation for a given atomic transition in a given light field (Fischer et al., 1998; Pantian & Yupapin, 2013; Jomtarak & Yupapin, 2014), which is associated with the strength of the coupling between light and the transition. Rabi flopping between the levels of a 2-level system illuminated with resonant light, which will be occurred at the Rabi frequency. The Rabi frequency is a semi-classical concept as it is based on a quantum atomic transition and a classical light field. In this study the human thought/feeling signals within the human brain

is modeled as an electrical pulse, which can be coupled and modulated into the micro-optical circuit by the THz light probe, in which the reflected signals are obtained via the signal direct detection or the drop port output signals, in which the interference output between photon and thought/feeling can be distinguished by using the filtering devices, where the variables such as wavelengths (frequencies), signal amplitudes and signal forms can be investigated. In principle, the projection in quantum life is the command which is connected to the materials, i.e. human body, which is the basic method that the observed variables in quantum mechanics is required (Beck & Colli, 2008). Similarly, in quantum life, the required variables are required to project to the measured parameters, i.e. thought/feeling, in which the unified explanation of the full range of human experience can be realized. In this study, the idea to our thought and feelings in the quantum field tells us that our thought and feelings originate in the field and are projected through our material bodies. The use of the proposed concept for human deep meditation, for instance, Čerenkov radiation, spirit and thought/feeling monitoring, sub-consciousness and nirvana investigations, and human supernatural power can be performed.

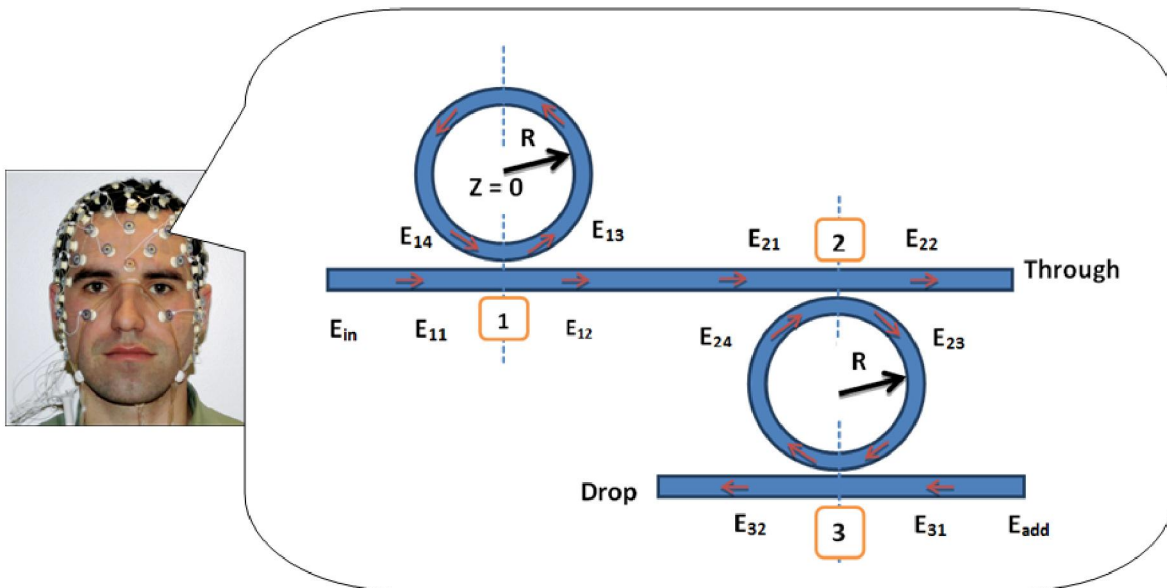
**2. Methodology**

Recently, Jomtark and Yupapin (Jomtarak & Yupapin, 2014) have shown that Čerenkov radiation of photons within a microring resonator system can be

generated, which is useful for imaging application. In this work, the other form ring resonator system is proposed for Čerenkov radiation, which can be used as a detection probe. The THz Čerenkov light probe within the system in Figure 1 can be analyzed by using the nonlinear Schrodinger equation of photon travelling within the system, which is given by Eq. (1), where more details are given by (Milonni & Eberly, 1998).

$$\frac{1}{A} \frac{dA}{dz} = -\frac{\alpha}{2} - \left(\frac{\beta}{2} - i\gamma\right) |A|^2 - \left(\frac{\xi_r}{2} + i\xi_i\right) |A|^4, \tag{1}$$

Where  $E(\mathbf{r}) \approx E(z) = \varpi A(z) e^{i\beta_0 z}$ ,  $\varpi = (\mu_0 / \varepsilon_0)^{1/4} (2n_0)^{1/2}$ .  $\mu_0$  and  $\varepsilon_0$  are the permeability and permittivity in vacuum, respectively. Where  $n_0$  is the linear refractive index,  $\beta_0 = n_0 k$  is the propagation constant with  $k = \omega / c$ ,  $c$  is the speed of light in vacuum and  $A(z)$  is the complex amplitude ( $|A|^2$  is the intensity,  $I$ ). The parameters  $\xi_r$  and  $\xi_i$  account for free-carrier effects. The parameters entering Eq. (1) are as follows:  $\alpha$  and  $\gamma = kn_2$  are the linear loss and the Kerr effect constants, where  $k$  and  $n_2$  are the wave number and nonlinear refractive index. The solution of Eq. (1) is given by  $A(z) = \sqrt{I(z)} \exp[i\phi(z)]$ . Then the electric fields on both sides of the point coupler satisfy the following relations.



**Figure 1:** The proposed Rabi oscillation system, where  $E_i$ : optical fields,  $R$ : ring radius, Drop: drop port,  $E_{dd}$ : add port, Through: throughput port; 1, 2, 3: coupling coefficients ( $r$ ) at points 1, 2 and 3 (Pantian & Yupapin, 2013)

Then the electric fields on both sides of the point coupler satisfy the following relations:

$$E_{14} = r_1 E_{11} + it_1 E_{13}, \quad (2)$$

$$E_{12} = r_1 E_{13} + it_1 E_{11}, \quad (3)$$

$$E_{13} = r_1 E(2\pi R_1), \quad (4)$$

$$E_{22} = r_2 E_{21} + it_2 E_{24}, \quad (5)$$

$$E_{23} = r_2 E_{24} + it_2 E_{21}, \quad (6)$$

$$E_{24} = r_2 E(2\pi R_2), \quad (7)$$

$$E_{32} = it_3 E(\pi R_2), \quad (8)$$

$$I_{12} = \left[ r_1^2 I_{13} + I(2\pi R_1) - 2r_1 \sqrt{I_{13} I(2\pi R_1)} \cos \Delta \phi_1 \right] / (1 - r_1^2), \quad (10)$$

$$I_{22} = r_2^2 \left[ I_{23} + I(2\pi R_2) - 2r_2 \sqrt{I_{23} I(2\pi R_2)} \cos \Delta \phi_2 \right] / (1 - r_2^2), \quad (11)$$

A relation for the intensity  $I_{32}$  can be obtained by using Eqs. (8) and (9).

$$I_{32} = (1 - r_3^2) I(\pi R_2), \quad (12)$$

From their conservation law of energy, we obtain

$$I_{11} = I_{13} - I(2\pi R_1) + I_{12}, \quad (13)$$

$$I_{21} = I_{23} - r_2^2 I(2\pi R_2) + I_{22}. \quad (14)$$

Where  $\Delta \phi_1 = 2\pi \beta_0 R_1 + \phi(2\pi R_1) + \phi_{01}$  and  $\Delta \phi_2 = 2\pi \beta_0 R_2 + \phi(2\pi R_2) + \phi_{02}$  are the phase shift acquired during a round trip in a micro-ring for single ring and add-drop. The intensities at input and output end of the straight waveguides can be related to their coupling intensities as

$$I_{in} = \frac{I_{11} \exp(\alpha L)}{\sqrt{1 + I_{11}^2 (\xi_r / \alpha) [1 - \exp(2\alpha L)]}}, \quad (15)$$

$$I_{tr} = \frac{I_{22} \exp(-\alpha L)}{\sqrt{1 + I_{22}^2 (\xi_r / \alpha) [1 - \exp(-2\alpha L)]}}, \quad (16)$$

$$I_{dr} = \frac{I_{32} \exp(-\alpha L)}{\sqrt{1 + I_{32}^2 (\xi_r / \alpha) [1 - \exp(-2\alpha L)]}}. \quad (17)$$

The dynamics of the probabilities are expressed by

$$\dot{c}_g = i\Omega^*(r) c_e e^{i\Delta t}, \quad (18)$$

$$\dot{c}_e = i\Omega(r) c_g e^{-i\Delta t}. \quad (19)$$

Where  $|c_g(t)|^2$  and  $|c_e(t)|^2$  are the probabilities of ground state and excited state,  $\Delta \equiv \omega - \omega_0$  is the

$$E_{31} = 0. \quad (9)$$

Where  $t_m = \sqrt{1 - r_m^2}$  and  $r^2$  is the fraction of power remaining in the straight waveguide after the coupler. We can express the intensities  $I_{12} = |E_{12}|^2 / \omega^2$  and  $I_{22} = |E_{22}|^2 / \omega^2$  in terms of their coupling intensity as  $I_{13} = |E_{13}|^2 / \omega^2$  and  $I_{23} = |E_{23}|^2 / \omega^2$  as given.

detuning,  $\Omega(r)$  is the Rabi frequency which represents the frequency of oscillation for a given atomic transition in a given light field, which is defined by  $\Omega(r) = d_{eg} \cdot E(r) / \hbar$ . The well-known Rabi oscillation frequency is obtained by Eqs. (18) and (19), which is occurred between the ground and excited states of the driven two-level system. From the trial solution,  $c_e(t) = e^{i\Delta t}$ , and considering the initial condition  $c_g(0) = 1$  and  $c_e(0) = 0$ . The probability to find atom in the excited state is given by

$$P_e(t) = |c_e(t)|^2 = (I / \Omega_R^2 \hbar^2) \sin^2(\Omega_R t / 2). \quad (20)$$

Where  $\Omega_R$  is the total Rabi frequency,  $\Omega_R = \sqrt{\Delta^2 + \Omega^2}$ .

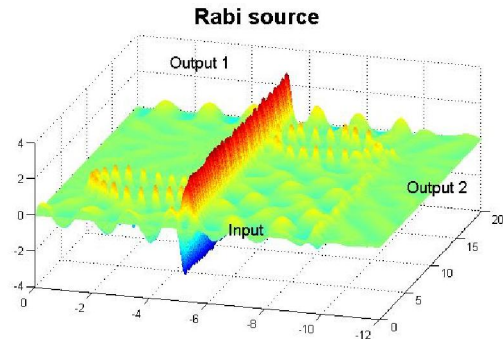
### 3. Simulation Results

In simulation, the above calculation was carried out for an silicon ring resonator with radius  $R_1 = R_2 = 5 \mu\text{m}$ , wavelength,  $\lambda = 1.55 \mu\text{m}$ , device length  $L = 10 \mu\text{m}$ , linear refractive index,  $n_0 = 3.484$ , a two-photon absorption constant,  $\beta = 0.5 \text{ cm (GW)}^{-1}$ , linear loss coefficient,  $\alpha = 1 \text{ dB (cm)}^{-1}$ . Free carrier life time,  $\tau = 1 \text{ ns}$ . Nonlinear refractive index  $n_2 = 6 \times 10^{-5} \text{ cm}^2 \text{ (GW)}^{-1}$ . Fractional power remaining in the straight waveguide after the coupler, i.e. coupling coefficients are  $r_1 = 0.5$  and  $r_2 = r_3 = 0.2$ . In applications, after light is input into the system at input port, the light probe is generated and accelerated (Sriphanachai et al., 2013), where the Čerenkov radiation can be formed. Figure 2 shows the result of light probes which is obtained by Opti-wave program (OptiFDTD, 2008). Light probes are oscillated with THz frequency region, which can be used to form the detection by connecting to the

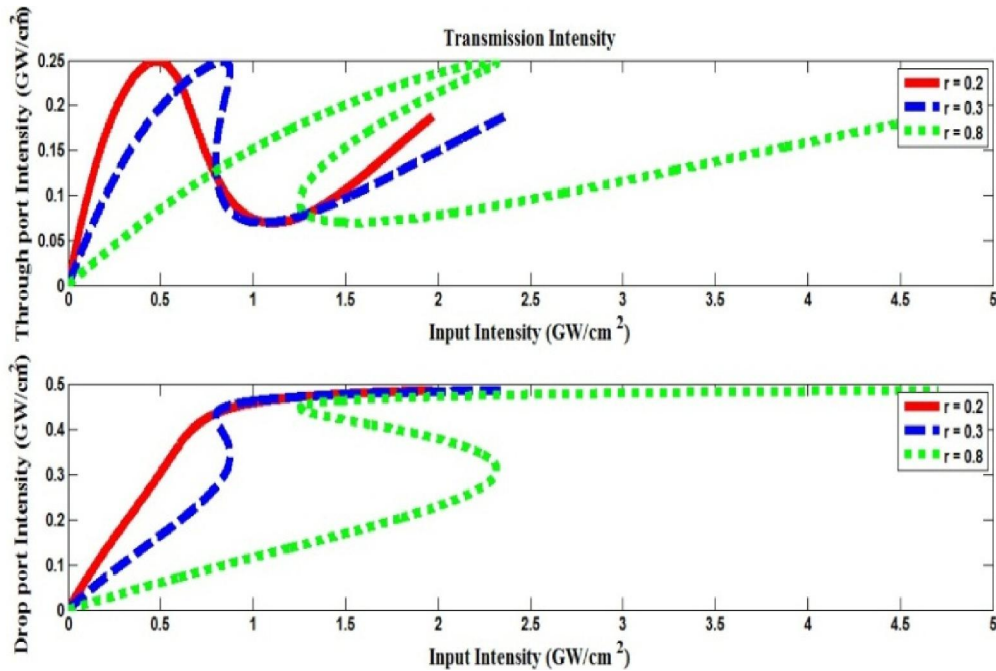
required measure area, where in this case the THz light probe can penetrate into the human tissue and form the measure. The monitoring signals can be detected via the Through (Output 1) and Drop ports (Output 2), respectively. The change in phase of light (particle) can be introduced the change in device output intensities, which can be used to monitor and measure the required physical parameters, especially, within conscious or sub-conscious states, where the link parameters can be seen and interpreted via the drop and through ports. Figure 3 shows the linear relationship of the signals can be obtained, which is suitable for sensor applications. In Figure 4, Rabi oscillation signals at Throughput (top) and Drop (bottom) ports. In Figure 5 shows the Rabi probability oscillation results, where dimension (a) Drop and (b) Through (put) port signals with frequency in THz region, where the change in Rabi frequency oscillation in the THz scale can be configured to be the relationship between the applied projection parameters and the shift in phase (frequency or time), especially, thoughts/feeling (brain signals) and the shift in frequency.

In this study, we propose the specific detection probe that can be formed by the interaction between the massless elements, i.e. photon and thought/feeling. Applying that idea to our thought and feelings in the quantum field tells us that our thought and feelings originate in the field and are projected through our

material bodies, where in this study the substance of the quantum field, the waves, is thought/feeling can be projected to the electrical signals via the Rabi oscillation probe. Our thoughts and feelings are quantum-level processes. With this much of the model we can be accounted for all of the supernatural power, consciousness and consciousness. Our thoughts, feelings, memories and the rest are all pure “information”, which means they have no mass. So when they are in the quantum coherent state they are distributed across space and time, just like photons and electrons, where the measurement can be done by using the projection concept.

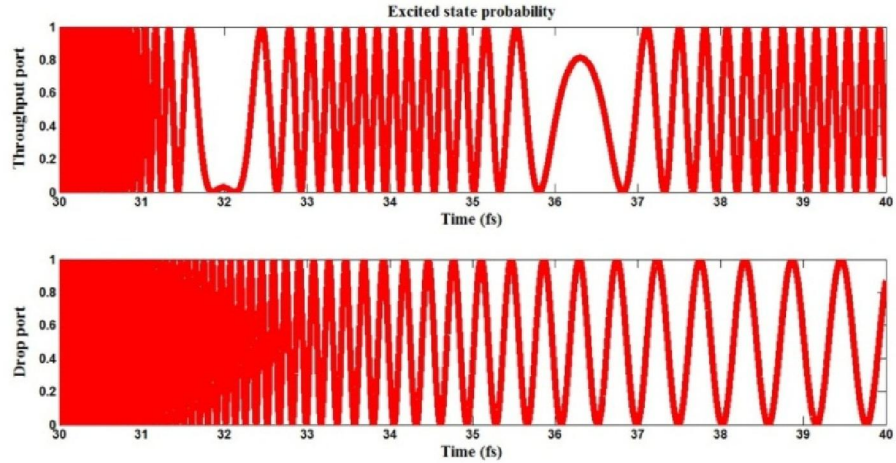


**Figure 2:** Rabi oscillation in a micro-optical ring resonator, where the particle (photon) oscillation is generated and seen.

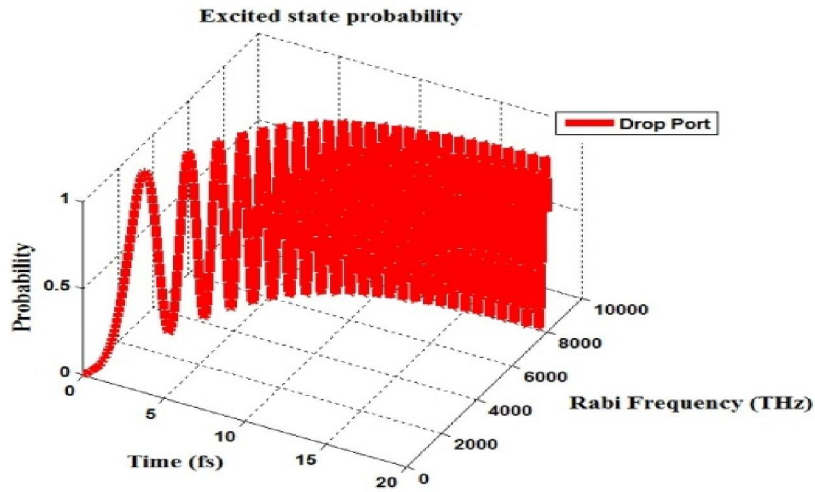


**Figure 3:** Plot of photon nonlinearity behavior, i.e. bistability with different coupling coefficients ( $r$ )

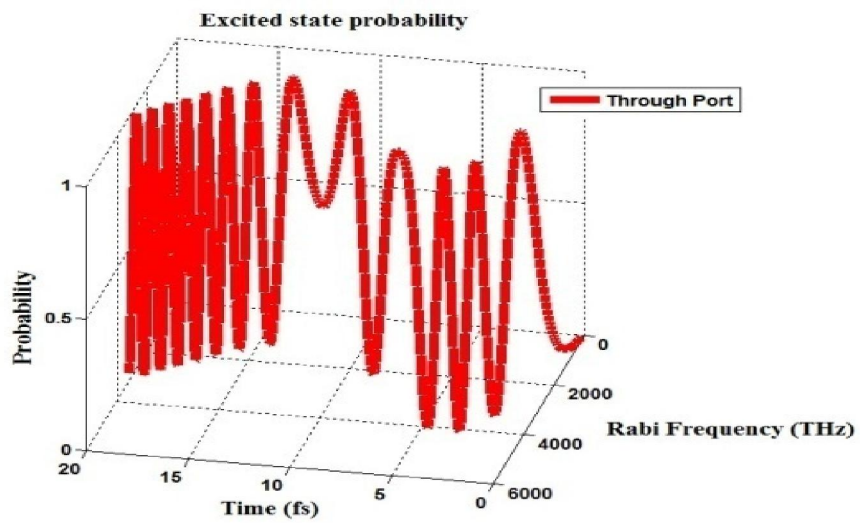




**Figure 4:** Rabi oscillation signals at Throughput (top) and Drop (bottom) ports



(a)



(b)

**Figure 5:** Rabi probability oscillation results, where (a) Drop and (b) Through (put) port signals with frequency in THz region

#### 4. Quantum Life Interpretations

Human bodies have a beginning and end in space and time, while our thoughts/feelings do not. This means that our thoughts/feelings exist before and after the life of our material bodies. This is the definition of soul, where the human soul (spirit) is never died, which means that there are existed in the universe (Tucker & Williams, 1997). Our health is a quantum level process, which can be projected and worked efficiently by light. The state of our health is carried in light that is in a superconducting state in our bodies, where anything that affects any part instantly affects the whole being. We often believe that only the Buddha, Bodhisattvas, gods or fairies have magical or supernatural power, where they are celestial vision, celestial hearing, the power of knowing others' minds, the power of performing miracles, the power of knowing past lives, and the power of eradicating all defilement. In fact, the supernatural powers can be formed by the deep meditation, which they are satisfied the quantum life principles. In this section, the result of meditation in Buddhism such as Čerenkov radiation, paradox states, spirit, supernatural power, dream and relics are discussed in details.

##### 4.1 Meditation

Meditation is the practical method of human, where in this case the propagation of massless element in the human cells can travel with speed greater than light within the medium, where finally it is possible to obtain a planar image of Čerenkov escaping from a human cells. Magical power can be obtained through meditation practices. Čerenkography is a potential novel medical tool to image superficial organs of patients treated with beta minus radiopharmaceuticals and can be extended to the imaging of beta plus emitters (Spinelli et al., 2013). In Buddhism, there were number of monks can obtain the Čerenkography after meditation, for instance, Buddha, in which the enlightenment was established. In the physical interpretation concept, if the model of massless element (though/feeling) propagates in human brain (or body), which is configured by a shiny, so the Čerenkov radiation can be taken place. When the Buddha was in the enlightenment status, the bright light around Buddha could be occurred.

##### 4.2 Čerenkov Radiation

Čerenkov radiation is the electromagnetic radiation, which is emitted when a charged particle (such as an electron) passes through a dielectric medium at a speed greater than the phase velocity of light in that medium. The charged particles polarize the molecules of that medium, which then turn back rapidly to their ground state, emitting radiation in the process (Georgescu, 2012). Čerenkov luminescence imaging is an emerging optical preclinical modality

based on the detection of Čerenkov radiation induced by massless element when traveling through biological tissues (cells), for instance, human brain or body tissues with a speed greater than light. Two states of radiation can be occurred only one state in each appearance, so we use the terms of space-time paradox for the two states as  $\langle S | T \rangle$ , where the terms of speed greater than light is formed, where in this situation the particle, spirit or soul can move freely in time.

##### 4.3 Spirit or Soul

Spirit (souls) in quantum life is similar to photon in quantum field, which is a massless element. In the nirvana state, there is no spirit re-established, which means that there is no time revolution. Spirit is the basic unit of life (non-material), while string is a basic concrete of matter in universe (material), where both string and spirit are never died (Gough & Shacklett, 1993; Williams, 2012). Spirit can transport in all dimensions because there is no time, which means that spirit can travel freely in time, where the memory concept is not existed in this situation. The dead body has no spirit, which means that there is no time because the human clock is established by the beginning and ending of spirit.

##### 4.4 Supernatural Power

Human health is considered as another aspect of life that is a quantum process, where the physiology is conducted by light. Specifically light in a quantum coherent state called super radiance, which is similar to superconductivity. Superconductivity is the electrical phenomena often described as electric current flowing without resistance. A more accurate description is to say that the electrons are all in a quantum coherent state. They are not flowing through the superconducting wire. Rather they are simply everywhere in the wire they can possibly be all at once. The light in our bodies works the same way. The state of our health is carried in light that is in a superconducting state in our bodies. Anything that affects any part instantly affects the whole being. Our health is a quantum level process. The superconductor medium can be occurred within the body when the Čerenkov radiation of all atoms are localized by meditation, where the magnetic monopole can be occurred and controlled, which means that the levitation (anti-gravity) concept can be realized. One of the supernatural powers known as levitation is the rising of a human body into the air by mystical means. Some parapsychological and religious believers interpret alleged instances of levitation as the result of supernatural action of psychic or spiritual energy (Winkelman et al., 1982; Radin, 2012).

##### 4.5 Dream and Paradox

In the dream, our mind runs on holograms, where all of our perceptions, thoughts, memories and feelings

are carried as holograms in our brains. Dreaming is the situation occurred while we are sleeping, which may be in the gap between consciousness and sub-consciousness, which is under the Čerenkov radiation. It can be described by the two states of consciousness and sub-consciousness,  $\langle C | SC \rangle$ , in which there is no time in the gap between the states  $\langle CS | C \rangle$ , which is may be caused by the Čerenkov radiation. Apparently, there are 3 dimensions in space localized and 1 time, where time is a free dimension that can go through. During the dream, a 4D (dimensions) person would be capable of passing through walls, disappearing and reappearing at will, seeing through buildings and finding hidden objects, and performing a surgery without even cutting the skin (Hallman, 2012a; 2012b; 2012c).

The paradox of our current location is the invisible image, which means that the invisible concept can be realized if the other component of paradox can be alternatively transferred. Paradox can be defined by the EPR (Einstein-Podolsky-Rosen) form as  $\langle C | SC \rangle$ , which means that it can be occurred only one event in each appearance. In human, the sub-consciousness can work during sleeping, where sometime they can obtain better results than the waking situations (Braud & Schlitz, 1991; Thompson, 1991), for instance, good works or ideas can be generated and obtained after waking up, however, they have always lost the connection of the paradox states, where sometime all details or procedures of the result methodology were lost. It is no time in the sub-consciousness situation, where the imagination (dream) can move freely in time within the localized space under the Čerenkov radiation, i.e. a space-time paradox,  $\langle S | T \rangle$ . By using the quantum life probe, the proposed detection scheme can be plugged to the required paradox state by using the quantum life detection probe, where the condition is that the measurement instrument must be in the same paradox generated by the Čerenkov radiation, otherwise, it will be disappeared, i.e. the information is lost.

#### 4.6 Nirvana and Relics

Stopping light is the concept of light which is stopped under the adiabatic system, where the particle (photon) or massless element (spirit) within the system is localized at rest, i.e. no movement. The stopping behavior can also be occurred in the Čerenkov radiated system, where the gap between group and localized particle velocities is existed within the stopping condition. For instance, after the man of knowledge (saint) who has been in the enlightenment state, the body components are purified and homogenous under Čerenkov radiation (Jang et al., 2013; Yupapin & Ali, 2013). Saint body is called a cold body state, which is become the everlasting body. This state is called nirvana (Tucker & Williams, 1997), whereas the

collection of components within the body can be freely clustered and purified, where finally the different forms of amorphous materials can be constructed, in which the different forms of amorphous material known as relics are obtained. Multi-wavelength Čerenkov radiation is also occurred, especially, in the visible wavelength spectrum, where the different amorphous material colors, i.e. multicolor relics can be formed. For instance, in Buddhism, relics of the Buddha or saints were constructed.

#### 5. Conclusion

Rabi oscillation system using a micro-optical ring resonator has been proposed, which can be used as a detection probe for quantum life investigations. The Čerenkov radiation frequency of massless particle (photon) can be generated and used for quantum life detection probe, which can be used to form the required measurement data during the Čerenkov radiation state. In applications, the relationship between the projection parameters, i.e. spirit, thoughts/feelings and photons can be established and analyzed. The other quantum life parameters such as human dream, sub-consciousness, perceptions, thoughts, memories and feelings and the related activities can also be projected and interacted with photons, where the required information can be observed and interpreted. Furthermore, the supernatural power such as telepathy, clairvoyance, precognition, and psycho-kinesis can also be investigated (Hirsch, 2012; Gough, 1997; Schwartz et al., 1996), which can be useful for future researches and investigations.

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