Cumulative Residual Photon Power Density of ~10^{-12} W·m^{-2} During Mild "Distress" in the Same Space: Implications for Temporal Entanglement

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ABSTRACT

The potential for entanglement of photons generated within the space-time continuum to remain as residuals of photon flux density within the same space requires excess correlations between successive temporal increments. Our model predicted that the quantitative relationship with the fundamental quantity of 10^{-20} J multiplied by the inverse diffusivity from the wave impedance and magnetic susceptibility of space and the electron orbital frequency would reflect excess correlation. The value would be ~10^{-12} W· m^{-2}. To test this prediction experimentally, different mice were serially exposed within the same container box or each mouse was placed in different container boxes placed in the same space for 3 min per mouse while photons were measured from the dorsal surfaces in hyper-dark settings. Before asymptote was evident around 30 to 35 min of serial exposures the net increase in photon flux densities within that same space was 10^{-12} W·m^{-2}. These results suggest that the same "space" may "store" photon-related information as indicated by previous experiments involving chemiluminescent reactions. We postulate that entanglement between photons emitted from biological systems during distress within the same space and specific concurrent magnetic field patterns may create the conditions for the "retrieval" of these photon patterns at some later date when these fields recur.

Key Words: photon emissions, entanglement, excess correlations, mice, biophotons

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Introduction

The assumption of a space-time manifold or a four dimensional fabric composed of the three traditional spatial planes and time predicts that there should be a residual of a representation of the spatial structure within that fourth dimension. To pursue the quantitative properties of this residual we considered that serial increments of three dimensional spaces (Δs) that define its successive maintenance of that space, that is the increments of time (Δts), must display excess correlations between them. From our perspective this suggests the successive Δts must be entangled and hence display excess correlations between and across successive organizations of space. As suggested by multiple experiments at the quantum level the most likely mediator of such excess correlation is the photon. Here we present evidence that irradiant flux densities from photon emissions from mice serially housed within the same space cumulate over time and that the

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asymptote is consistent with a physical model of entanglement including its intrinsic velocity.

If increments of space are integrated over increments of time because the Δts are entangled, then there should be evidence of persistence of temporal patterns of photon emissions or the residual of their radiant flux densities within the same space. Dotta and Persinger (2012) found that the photon emissions from two chemiluminescent reactions separated by 10 m and induced experimentally by injections of small aliquots of reactant displayed a doubling of photon emissions when the two loci shared specific types of circular magnetic fields with specific angular velocities. They suggested this doubling of photon emissions (as if twice the amount was injected into one space) was an example of entanglement-related superposition. It appeared as a superimposition of the two loci such that they became the same space. However, this effect was transient and dissipated after about 8 min and involved a procedure whose duration was about 20 min. A similar example of "excess correlation" between spaces that shared the appropriate rotating magnetic fields was noted for subtle shifts of pH in spring water whereby the injection of small amounts of protons (increased acidity) in one volume was associated with a small but energy-proportional increase in alkalinity in the untouched volume during the same phase of the experiment that showed the excess correlation for the photons.

When Dotta and Persinger (2011) inadvertently measured the photon emissions within the same space when the original magnetic fields were activated but *no reactant* was injected there was a conspicuous "spontaneous" increase in photon emissions. The burst frequency of these photon bursts were similar to the injection frequency (once per minute) for the experiments of the previous days when 1 cc of reactant was injected simultaneously into each volume of hypochlorite once every minute. During subsequent experiments the inter-injection times were reduced to either 30 s or 15 s. After a few days of these injections, only the activation of the associated magnetic fields (without injection of reactant) produced spontaneous photon emissions on average every 30 or 15 s, respectively. This "retrieval" could be obtained for about 3 to 4 days after the previous pairings. However, these spontaneous manifestations with only the magnetic field activation occurred only once. The experimenters suggested they had demonstrated a potential example of "space memory" that was coupled to photon emissions elicited within specific conditions that are associated with entanglement between the magnetic field configuration and the photon emissions.

There have been persistent cross-cultural and historical references to events that occur within the "present" displaying residual manifestations minutes to years after their occurrence. Usually the initial events were associated with might be considered enhanced physiological arousal such as terminal conditions of an organism or the sudden release of energy from a physical process. The form of the post-event manifestation when perceived and reported by human observers often involves varying degrees of apparent visual density that range from a nearly-transparent photonic field to an opaque or solid state that appears "real". In most cases these manifestations are reiterations of the original event as if the sequences of the event were, to employ a modern metaphor, "replayed". These events often occur in temporal clusters and in our unpublished studies are moderately correlated with the occurrence of global geomagnetic activity whose intensities are similar to the conditions at the time during which the initial event occurred. However, if these phenomena involve a space memory because of entanglement between successive increments of space-time, concurrent photon emissions, and an electromagnetic factor, then there should be evidence of "photon" accumulation that exhibit predictable temporal and flux densities. These increases of photon flux density within the same space would be a pre-requisite for entanglement by the appropriately-patterned magnetic fields.

The Model

There is compelling evidence that two values that exhibit universal presence is the quantity of energy of $\sim 10^{-20}$ J and the flux power density of $\sim 10^{-12}$ W·m^2 (Persinger, 2015a; Persinger *et al.,* 2015; Vares and Persinger, 2013). The former is associated with the energy associated with forces between the distances of the potassium ions applied across that distance that contribute to the resting membrane potential as well as to the action potential of neurons (Persinger, 2010). At a more fundamental level, this quantity of energy is resident within water (Karbowski and Persinger, 2015). If the ratio of the proton's magnetic moment ($1.41 \cdot 10^{-26}$ A·m^2) is divided by its unit charge ($1.6 \cdot 10^{-19}$ A·s) the resulting diffusivity term is $0.88 \cdot 10^{-7}$ m·s^{-2}. When multiplied by the average viscosity of water around life temperatures ($6.3 \cdot 10^{-3}$ Pa·s), the resulting force is $7.87 \cdot 10^{-11}$ kg·m·s^{-2}. When this force is applied across the distance of two O-H bonds ($1.92 \cdot 10^{-10}$ m) the energy is $1.5 \cdot 10^{-20}$ J.

This is not only within the energy range associated with the movement of a proton from the hydronium ion through water. It has been shown to be the solution for the energy when the proportional force within the entire universe per Planck's voxel is multiplied by the distance of the neutral hydrogen line (Persinger, 2015b). From the perspective of the operation of the photon within this convergent value, it may be relevant that the product of the upper limits of the rest mass (Tu *et al.,* 2015) of a photon ($2 \cdot 10^{-52}$ kg), the velocity of light in a vacuum ($3 \cdot 10^8$ m·s^{-1}) and the entanglement velocity calculated by three different methods ($2.8 \cdot 10^{23}$ m·s^{-1}) is about $1.71 \cdot 10^{-20}$ J. If the photon is involved with the integrative process that produces the continuity within the space-time manifold (the entanglement between successive Δts for configurations of space), then this type of hybrid sharing of the velocities of light and entanglement would be expected.

The second universal increment (10^{-12} W·m^{-2}) has been measured from aggregates of cells within cultures. More specifically for neuroquantology, it is a connecting quantity between the average energy within the universe and the photon emissions from the human cerebral cortices. The average density of the total energy within the universe is about $0.3 \cdot 10^{-9}$ J·m^{-3} (Adler, 1995; Persinger and Saroka, 2014). Within the human cerebrum which is about $1.3 \cdot 10^{-3}$ m^{-3}, this "potential" energy would be $3.9 \cdot 10^{-13}$ J per implicit second (Watts). When divided by the average surface area of the cerebral cortices ($1.8 \cdot 10^{-1}$ m^2), the resulting flux density is ~$2.1 \cdot 10^{-12}$ W·m^{-2}. This is within the range of experimental values measured at 15 cm from the right side of the heads of volunteers sitting within hyper-dark conditions when they are instructed to imagining white light compared to more mundane images. Several experiments involving human brains, cell culture, and free space have shown that for every 1 nT decrease in the adjacent magnetic field strength of the earth as measured by a magnetometer the photon flux densities from this space increased by 10^{-12} W·m^{-2}.

The relationship between W·m^{-2} and J·s^{-1} can be equated by:

$$W \cdot m^{-2} = (s \cdot m^{-2}) \cdot (J \cdot s^{-1}) \cdot s^{-1} \quad (1),$$

or as stated semantically the flux power density is equal to the product of joules per second, the inverse of diffusivity and frequency. We would expect the values for these quantities to be universal. We assumed s^{-1} is the rotational Bohr frequency for an electron ($6.59 \cdot 10^{15}$ s^{-1}). For inverse diffusivity we assumed that the wave impedance of 376.73 Ω applied across the hydrogen wavelength ($2.12 \cdot 10^{-1}$ m), or $7.79 \cdot 10^1$ Ω·m. When divided by magnetic permeability in a vacuum, which is $1.26 \cdot 10^{-6}$ N·A^{-2}, the diffusivity would be $6.33 \cdot 10^7$ m^2·s^{-1}. The inverse value is $0.16 \cdot 10^{-7}$ s·m^{-2}. The product of $1.5 \cdot 10^{-20}$ J (the basic quantity that emerges as a property of water and the energy per Planck's voxel), the inverse diffusivity term and the Bohr frequency is $1.6 \cdot 10^{-12}$ W·m^{-2}.

These relationships indicate that the proton may be central to this process. However, if entanglement were involved, there must be a quantified duration whereby this process occurs. The contraction of space-time according to Lorentz, which has served as a fundamental basis for various forms of relatively theory, indicates that shifts in a parameter such as time is:

$$\sqrt{[((1-v^2(c^2)^{-1})]^{-1}} \quad (2).$$

If entanglement is intercalated with this process, then the quantitative values associated with this condition should solve for basic properties of the limit to the excess correlations between successive times of a spatial configuration and involve energies that correspond to the activity of fundamental particles. The connection should reflect an essential geometry of space-time that reflects the universe as a unit.

Persinger and Koren (2013) calculated the product of the closed symmetrical boundaries, a circle, or 2πr, 4πr^2, 4/3πr^3, 2πrf to be 21.3π^4 m^7·s^{-1}. When set equal to the optimal combinations of four universal values, the gravitational constant G, and the mass, length and duration of the universe to produce the same dimensional units, they found a velocity term of $2.84 \cdot 10^{23}$ m·s^{-1}. A similar value was found for the ratio of the V·m^{-1} divided by B, the magnetic field strength when all of the energy within the current universe was transformed to those two qualities and quantities. When the circular dimension for the hydrogen line (2πλ) was divided by a "jiffy" (the time required for the velocity of light to traverse the radius of an electron) a similar velocity term emerges.

Several theoretical quantifications (Hoffman *et al.,* 2007; Persinger, 2012; 2014) have shown the relevance of $21.3\pi^4$ as an energetic reservoir for the entire universe including that which is yet to be displayed. For equation (2) to produce the inverse ($4.82\cdot10^{-4}$) of this value $2.08\cdot10^3$, the v must be 0.9999998839 c. When applied to temporal dilation, for every 1 s the expansion would involve 34.5 min. We assumed this value would reflect a window of representation. In several unpublished analyses we have shown that the spectral power densities of background photons measured as both numbers of photons per s by digital photomultiplier units and flux power density per min by analogue units indicate a subtle but reliable inflection of spectral power densities at frequencies which are equivalent to about 30 to 35 min.

When applied to the energy equivalence of the mass of an electron assuming complete transformation at c^2, the difference in energy between c^2 and the v^2 associated with the contraction 0.9999998839 is $1.9\cdot10^{-20}$ J. There are two potentially relevant relations. First, the energy associated with the mass of an electron moving at the velocity of the solar system around the galactic center ($2.42\cdot10^5$ $m\cdot s^{-1}$) is about $2.2\cdot10^{-20}$ J. Consequently, the energy associated with the Lorentz contraction for the geometric difference associated with the potential structure of space is similar to that amount at more galactic levels or the space occupied by galaxies. Second, the difference of $21.3\pi^4$ is remarkably similar to difference between the energy of the proton and electron when expressed as Compton wavelengths. That the electron and proton may be related to a singular source from the universal set (the universe) has been calculated previously (Persinger and St-Pierre, 2015). Finally, the local rest mass of an electron ($9.10939\cdot10^{-31}$ kg) multiplied by the geometric value is $1.89\cdot10^{-27}$ kg. This is within ~12% of the mass of proton and ~6% of that of a Higgs' boson.

Integrating the above information, we expected that there would be an accumulation of photon flux density within the same space occupied by successive different mice who were mildly distressed from removal from the home cage and placement within a closed area. The asymptote of this accumulation should be around the equivalent of the net increase of $\sim10^{-12}$ $W\cdot m^{-2}$. The time required to achieve this "saturation", which would reflect the Lorentz contraction value and the inflection for the background spectral power densities of "random" photon emissions, should be in the order of 30 to 35 min.

Methods and Materials

In three separate experiments adult male C57 mice that had been maintained 4 per cage within standard colony room conditions were selected as subjects. A total of 42 mice were involved. Each mouse was placed within a "container" box that was housed within a larger box. The larger box was 0.3 m x 0.3 m by 0.3 m and composed of 1 cm thick pine wood that had been painted black. The container boxes for the mice were composed also composed of light-colored wood. Each box was 9 cm x 5 cm x 5 cm; the walls were 05 cm thick. They had been purchased (as "craft boxes" from a local novelty store. All metal, including screws and the tops had been removed. A diagram of the arrangement is shown in Figure 1. Each mouse remained in the container box within the larger box for 4 min. To ensure the mouse's position within the box, a medium transparent plastic cell culture plate was placed on top of the container box. For 2, 100 s measurements the numbers of photons per s were collected at 50 Hz (20 ms increments, the limit of the software) by a SDNS tech PMT DM0090C digital photomultiplier. The aperture was placed faced down on the plastic cell culture plate in order to access the photon emissions from all angles. The output was sent to a Lenovo laptop computer which contained the software for analyses. The means of the numbers of photons for each of the 100 s samples for each mouse were averaged.

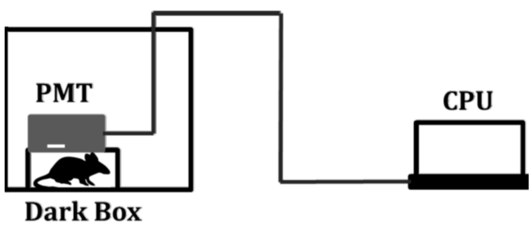

Figure 1. Diagram of the experimental arrangement where the photon flux densities within the same space (the small dark rectangle containing the mouse silhouette) was measured. The grey rectangle refers to the PMT and the small thin white rectangle indicates its aperture above the mouse. All of the equipment was placed in a larger box. The computer system recording the data was external.

The experimental room in which the measurements were completed was dark except for dim lights (< 1 lux) from the computer screen in order to minimize the effect on the PMT sensor that remained within the large dark box at all times. After each mouse was placed in the container box the PMT with the aperture facing towards the mouse was inserted over the plastic cell culture plate that covered the top of the container box. The top of the large box was then covered with several layers of thick black terry cloth towels. When the measurement for a mouse was completed it was removed and another mouse was placed within the same container box and the procedure was repeated. In part 1 of the experiment (composed of two parts) 6 and 12 mice were serially placed within the *same* container box while their photon emissions were measured. In part 2 of the experiment, to verify that the space and not the box were responsible for the photon flux density residue effect, each of the 12 mice that were sequentially placed in the same space were was housed in its own container box (i.e, 12 different boxes). This experiment was repeated twice.

Results

The numbers of photon emissions per second within the same box as a function of the successively different mice (M1 to M12) placed in the space for the second part of that experiment are shown in Figure 2. As the numbers of mice (M) that occupied the same box and the same space increased, the differences from the original photon flux densities as inferred by the increase in photon counts per s increased. The mean numbers of photon count per s ranged from about 1700 photons per s for the first mouse to about 2200 to 2300 from the 12th sequential mouse. However, the cumulative increase in photon counts displayed an inflection point at mouse 5 (20 to 24 min) and achieved asymptote by about mouse 7 or 8. (28 to 32 min).

Assuming $\sim 5 \cdot 10^{-19}$ J per photon at the optimal peak of the PMT the energy associated with 1700 photons for the first mouse would have been $8.7 \cdot 10^{-16}$ W and for the final mouse would have been $11.7 \cdot 10^{-16}$ W. The net difference between the two boundaries would be about 2 to $3 \cdot 10^{-16}$ W. Because the area of the aperture was about $3 \cdot 10^{-4}$ m^2, the *net increase* in flux power density before the inflection point occurred and the asymptote began around 30 to 35 min would be $\sim 1. \cdot 10^{-12}$ W·m^{-2}. Both the duration to achieve the asymptote and the shift in total flux power density before this asymptote occurred are consistent with our model and hypothesis regarding "space memory" and its potential reflection of the entanglement between successive temporal intervals of spatial structure.

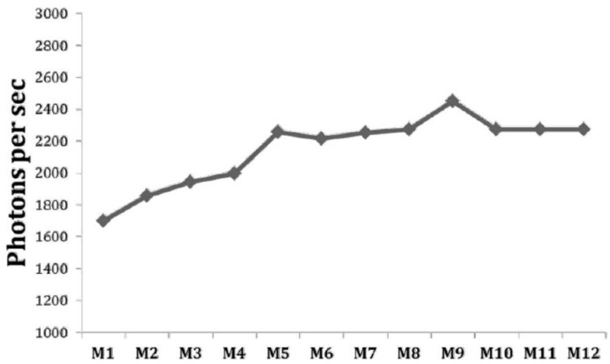

Figure 2. Numbers of photons per s measured through a ~3 cm^2 aperture over the dorsal surfaces of successive mice (M) placed in the same space within a hyper-dark environment. The numbers refer to the order the mice were placed in the same space.

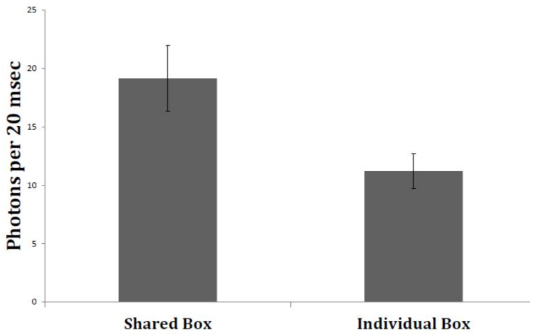

Figure 3. Numbers of photons per 20 ms (limits of equipment) for mice within the same box over time or individual boxes over time. Vertical bars are SEMs.

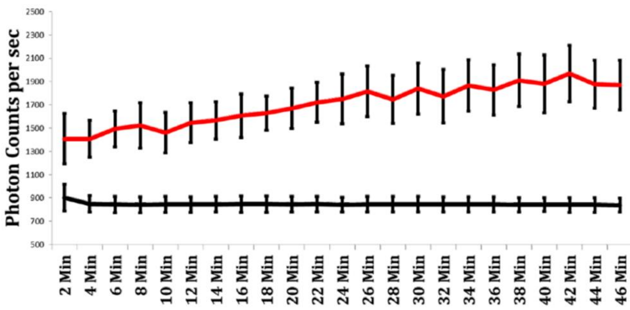

Figure 4. Numbers of photons per second as a function of the duration the same space was occupied by different mice placed in either the same container box or in each of their own container boxes. Black refers to baseline counts without mice present. Red line refers to the photons counts when mice were within the same space.

The mean numbers of photons per 20 ms (the upper limit of our software for data collection) from the condition in which all mice shared the same box within the same space or shared the same space but had been placed in their own individual boxes are shown in Figure 3. The vertical bars indicated Standard Errors of the Mean (SEMs). The difference between the photon emissions from mice placed in the shared box and the mice each placed in separate boxes was 18 and 12 units per 20 ms or 900 to 600 photons per s. The total (cumulative) flux density, assuming the quantum of energy per photon was within the range of 10^{-12} W $\cdot$m^{-2} for both. We considered this evidence that the individual box, per se, was not the source of the effect. Instead it was the cumulative effect of different mice displaying photons within the same space that elicited the effect. When the data for the single container box and multiple container box were combined, as indicated in Figure 4, the shift of about 400 counts per s before the asymptote was approached is evident. The vertical bars are standard deviations and not SEMs.

Discussion

There are many historical and cross-cultural references to the possibility that space-memory exists for events that involved distress or significant alterations in physiology that we now realize would be associated with increased photon emissions. Our approach to the four-dimensional space-time manifold is that spatial arrangements of matter and processes display excess correlations or entanglement with successive increments of time. However, there should be a limit to the displacement of the manifestations of these increments with which the excess correlations are evident. This limit would reflect the duration required for the "consolidation" of the information within a broader space-time context which might be accessed under specific conditions. In our experiments involving patterned elicitations of photon emissions within entanglement paradigms, the access required the production of the same field conditions under which the entanglement occurred (Dotta and Persinger, 2011). A similar phenomenon was measured for the occurrence of pH shifts within spring water within the same area when the paired magnetic field was activated (Dotta *et al.,* 2014)).

In the present experiment serial placement of different mice in the same box or the serial placement of different mice each in their own box within the same space produced a comparable increase in photon flux density. The asymptote for the net increase in this flux density compared to baseline occurred around 10^{-12} W$\cdot$m^{-2}. According to the model the mediation required to produce the 10^{-20} J that would allow access to sub-matter regions of space within which entanglement might occur (10^{-12} W$\cdot$m^{-2}) must be multiplied by the inverse of the diffusivity term based upon universal wave impedance and magnetic susceptibility and the frequency of the Bohr magneton. The latter reflects the time required for one orbit of an electron. We assumed diffusivity that included the appropriate combination of the impedance of free space and the magnetic permeability of free space (within which matter is contained) would be essential

The discrete amount of increase in energy that increased during the successive placement of different mice in the same space ranged from about 3.5 to $4.5 \cdot 10^{-16}$ J per second. When divided by the frequency of the hydrogen wavelength, 1.42 GHz, the value slightly exceeds the energy associated with the neutral hydrogen wavelength. If entanglement were to be involved with this process one would expect quantities of energy that would access or at least be potentially resonant with one of the most fundamental oscillations within space throughout the universe. This is the hydrogen wavelength. The test of the validity and "generalizability" of the effect measured in the present study will require its application to larger space-time phenomena.

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