



Inflections of Periodicities of Background Photon Spectral Power Densities Are Predicted by the Lorentz Contraction for a Potential Indicator for the Intrinsic Structure of Space

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ABSTRACT

The value for the Lorentz contraction to produce a discrepancy for a hypothetical number that reflects a property ($21.3\pi^4$) of sub-matter space was calculated. When applied to time the contraction would be ~ 35 min. The difference in mass-equivalent energy for an electron at c (the velocity of light in a vacuum) and the required v was $\sim 2 \cdot 10^{-20}$ J which has emerged as a significant quantity that may permeate from the force at Planck's Length when applied across the wavelength of the neutral hydrogen line. Two separate types of photomultiplier instruments (digital and analogue) measuring with different sampling rates for background photon quantities over 50 randomly selected days demonstrated averaged conspicuous inflections of standardized spectral power densities around 35 min. This is the same basic interval where microvariations in the value of the gravitational constant (G) approached a limit at which white noise dominated. The possibility is considered that this value for temporal inflections in photon power spectral densities may reflect the intrinsic nature of space-time contractions that relate gravity and photons.

Indexing terms/Keywords

Lorentz contraction; Photon flux density; Entanglement velocity value; $21.3\pi^4$, 10^{-20} J

Academic Discipline And Sub-Disciplines

Quantum Physics, Astrophysics, Space-Structure, Photons

SUBJECT CLASSIFICATION

Photon Flux Densities, Spectral Power Densities

TYPE (METHOD/APPROACH)

Quantitative Analyses, Convergent Operations, Experimental Data

INTRODUCTION

The nature of space-time has been described by a variety of models that include geometries proposed by Minkowski [1] Hilbert [2] and many others [3]. These geometries then influence conditions for coherent states of identical particle systems. One example is the Dicke model [4, 5]. The application of the Lorentz contraction can be considered a special condition where relative velocities compared to that of light in a vacuum are reflected in discrepancies in mass, time, or space. Although the traditional interpretation involves different inertial frames, there are other applications. One of the fundamental units of the universe, the photon, has been associated with the nature of space-time through the major integrating forces (gravity) as implied by the Newtonian constant G ($6.67 \cdot 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$). Calculations as well as theory have indicated that gravitational and photon phenomena are either strongly related or share a common source of variance [6,7].

Quinn et al [8] while measuring the fluctuation in G , which usually ranges in the order of 10^{-3} of the constant, noted that approximately 30 min was the threshold where stochastic (random) and reliable variations could be discerned with contemporary instrumentation. The others of magnitude of these variations in G were similar to those measured by different methods by Vladimirov and Bruns [9] two decades earlier. Persinger and Koren [10] had shown by several methods that the relationship between the products of closed boundaries that produce a four dimensional geometry resulted in a constant $21.3\pi^4$ multiplied by the appropriate spatial-temporal aggregate $r^7 f$ where r is the radius and f is frequency. The potential validity of this relationship was indicated by the solution,

$$21.3\pi^4 = G^2 \cdot m^2 \cdot l \cdot t^3 \quad (1),$$

where G is Newton's gravitational constant, m is the mass of the universe, l is its length and t is its duration (age). This equation solves for a "diffusion velocity" that is the same order of magnitude as that obtained from two other methods. One involved the ratio of the total energy of the universe as reflected in the ratio of the averaged magnetic flux density (B) and potential difference (V) per meter [11]. The other is the "jiffy" (the radius of the electron divided by the velocity of light) when it is divided into a very specific distance, the hydrogen wavelength (21 cm). All solutions suggest a velocity in the order of $10^{23} \text{ m} \cdot \text{s}^{-1}$. The value has been considered the velocity for "excess correlation" or "entanglement". Both quantitative estimates for local physical chemical events and experimental data support the presence of this dispersion rate.

Spontaneous ground level photon densities have been measured more or less continuously in our laboratory for almost a decade. Our primary goal was to simply monitor background flux densities that might be relevant for predicting



global seismic events [12]. However while assessing the spectral power densities of the photon emissions, a reliable inflection of the flux density was noted that was similar to that observed for measuring fluctuations in G. The temporal value was predicted by the Lorentz distortion associated with an intrinsic shift of $21.3\pi^4$ that was the derived geometric component of the potential “entanglement” or excess correlation velocity [10].

CALCULATIONS

According to the classic relationship for the Lorentz contraction,

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

where v is the velocity in question and c is the velocity of light ($2.99792458 \cdot 10^8 \text{ m}\cdot\text{s}^{-1}$), the value for v to produce a shift of $21.3 \pi^4$ would be $0.9999998839 c$. This would be the equivalence of a contraction of ~ 35 min.

Assuming the classic formula for the energy equivalence for the rest mass of an electron, the difference in energy between that associated with c ($81.87659678 \cdot 10^{-15} \text{ J}$) and with $0.9999998839 c$ ($81.8765777 \cdot 10^{-15} \text{ J}$) is $1.9 \cdot 10^{-20} \text{ J}$. This is the order of magnitude that may exist as some manifestation at Planck's Length [13]. For example, the total force of the universe ($\sim 10^{164} \text{ N}$) from classical approaches is quantitatively obtained from an estimated mass (10^{52} kg), length (10^{26} m), and square (10^{86} s^{-2}) of the zero point oscillations (Zitterbewegung). The numbers of Planck's voxels (the cube of Planck's length) within the estimated volume (regardless of shape) would be 10^{183} m^{-3} . This results with a force of 10^{19} N . When applied across the length of the most prevalent wavelength, the neutral hydrogen line (0.21 m), the energy is $\sim 10^{-20} \text{ J}$.

METHODS AND RESULTS

In order to discern if there was a visually discernable inflection point in the intrinsic spectral power densities of the temporal periodicities of photons spectral analyses were completed for 5 separate clusters of 10 sequential days (total $n=50$ days) of digital photomultiplier unit (32,000 measurements per day) between August and December 2013. The details of the characteristics of the digital photomultiplier unit have been reported elsewhere [14]. Spectra densities for the z-scored numbers of photons per s (sampled every 2.5 s) were obtained and averaged for each 10 day cluster. The standardized (z-score) spectral power densities for the mean of the five different clusters were plotted as a function of real time in seconds (period). As noted below there is a clear inflection point in the power density at about 2,000 s (~ 33 min). Only power densities < 3000 s were plotted because after this duration (5 hr) there was a massive increase in magnitude that was more related to the temporal boundaries of the algorithm.

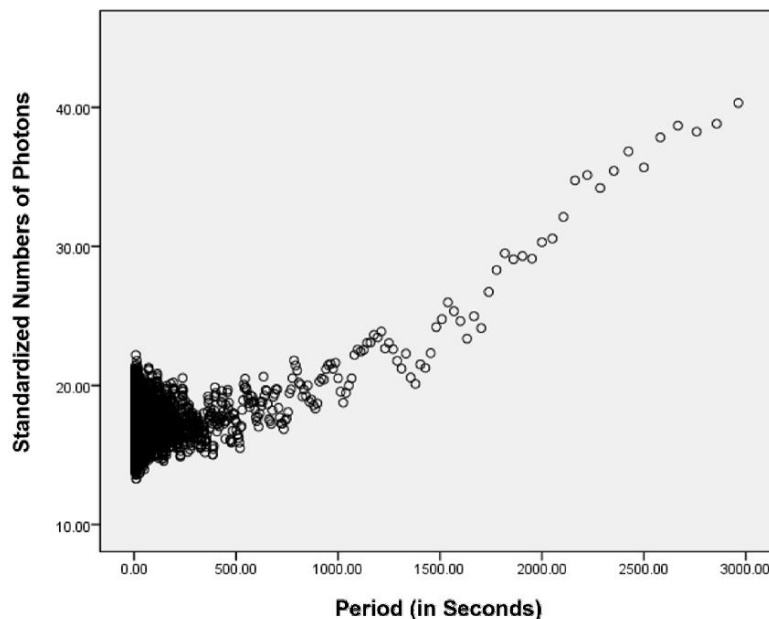


Figure 1. Mean standardized power densities for 50 days (32,000 measurements per day) of digital photomultiplier unit data.

In order to ensure that this pattern was not an artifact of the sample sizes (cases) or the digital method, comparable numbers of 10 sequential day clusters were obtained from the records for Aug and Sep 2013 recorded by our analogue photomultiplier tube unit in another location at a distance of ~ 3 km. Its specifications have been reported in detail elsewhere [15]. Because the samples were once per min (60 s), there were 1440 measurements per day. The standardized (z-score) mean spectral power densities for the clusters of days obtained by this PMT ($\text{W}\cdot\text{m}^{-2}$) are shown below. A very similar inflection point occurred around about 2,000 s.

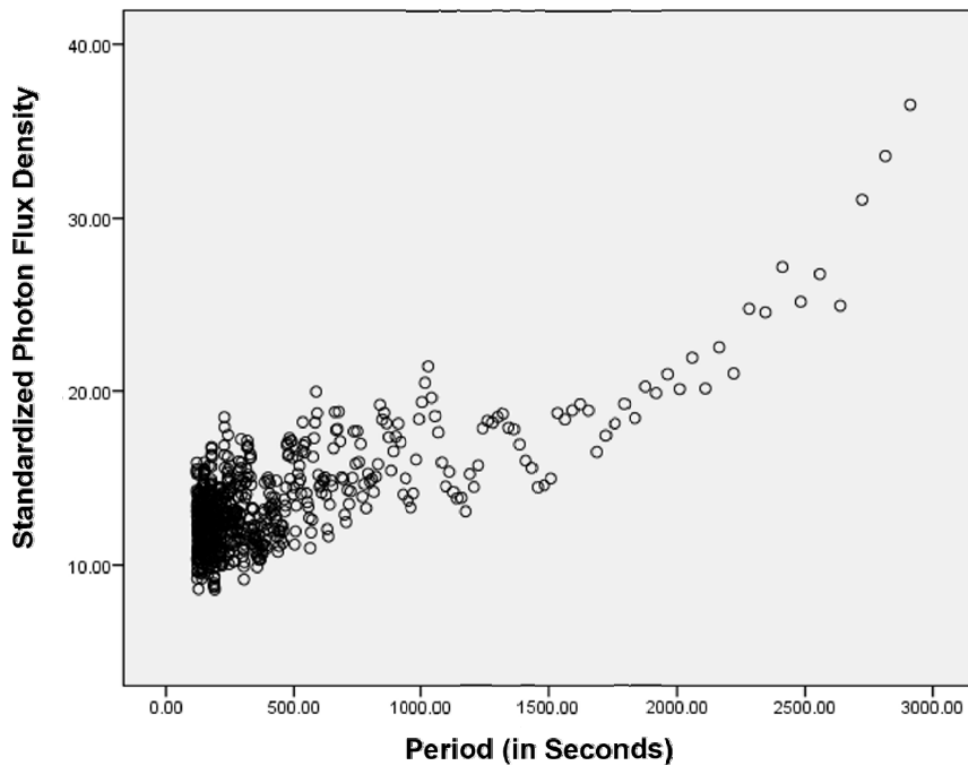


Figure 2. Mean standardized power densities for 50 days (1440 measurements per day) by an analogue photomultiplier unit.

DISCUSSION

These results suggest the presence of a conspicuous inflection or deviation for the variations in photon spectral power densities at around 30 min. Comparable values were obtained from two different methods, digital and analogue photomultiplier systems, of measuring photon flux density and numbers of photon counts. The Lorentz contraction was initially developed to discern shifts in the frameworks of inertia or space-time relationships. For the present approach the context was derived from the constant that emerged when the equivalence between four-dimensional closed geometry and the boundaries of the universe for its primary components: gravity, mass, length and time, indicated by equation (1) was determined. It would not be unreasonable to consider this relationship the “inertial frame” equivalence for the entire set that is embedded in its total duration rather than relative to another system existing simultaneously which is the usual application.

If the magnitude of the contraction of the velocity of the system relative to the velocity of light in a vacuum is matched with the coefficient obtained for the four-dimensional space derived from closed geometries, the quantity of temporal contraction is about 35 min. The difference in energy-equivalence for the rest mass of an electron and the energy from a slightly modified velocity that produces the ratio of $4.819 \cdot 10^{-4}$ or 2,075, the constant $(21.3\pi^4)$, that is related to G, the mass of the universe, its length and its duration is revealing. This value, which is the difference for the mass of an electron from c and from that v , is about $1.9 \cdot 10^{-20}$ J.

The quantity is the solution for the amount of energy per Planck's voxel distributed across the 21 cm “standing wave”. If this is valid then this quantity could interrelate the smallest units of space with the totality of space. One would expect that intrinsic unit of space should be reflected in the contraction associated with time. Indeed the results support his approach. However there are simultaneous and alternative accommodations. The 10^{-20} J does have other potential origins. For example the classic $\frac{1}{2}mv^2$ for an electron mass moving with the solar system around the galactic center at $\sim 242 \text{ km}\cdot\text{s}^{-1}$ results in an energy of $2.2 \cdot 10^{-20}$ J. For the quantity of $\sim 1.9 \cdot 10^{-20}$ J, the velocity would be $\sim 230 \text{ m}\cdot\text{s}^{-1}$. In other words the energy equivalence of the mass of an electron moving within the inertial frame of reference of the entire solar system around galactic space reflects the grand value of the Lorentz contraction.

CONCLUSION

Spectral power densities for ground-level photon flux densities or photon counts employing two different types of instruments within hyper-dark spaces indicated an inflection around 30 to 35 min. range which is the temporal discrepancy predicted by the standard Lorentz contraction for a constant that may reflect the intrinsic nature of the structure of space. The energy differential for the two velocities, one of which is c , to produce this discrepancy is equivalent to 10^{-20} J. It may be a pervasive unit at the level of Planck's Length that integrates sub-matter space across the neutral hydrogen line.



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Author's Biography with Photo



Michael A. Persinger, Ph.D. is a Full Professor at Laurentian University in Sudbury, Ontario, Canada. He is affiliated with a number of different programs including Biomolecular Sciences, Behavioural Neuroscience and Human Studies as well as the Quantum Molecular Biology Laboratory where he is examining the relationship between 10^{-20} J events within the brain and complex functions. Dr. Persinger and his colleagues have experimentally demonstrated the validity of Cosic's Molecular Resonance Recognition Model, Bokkon's Cerebral Photon Field Hypothesis and the efficacy of proton driving patterned magnetic fields that inhibit the growth of cancer cells but not normal cells. He is an interdisciplinary scientist whose primary goal is to integrate the physical sciences, social sciences and humanities according to their fundamental operations. Within the last 50 years he has published more than 500 technical articles in a variety of areas that range from Astronomy to Zoology. His present experiments are focused upon understanding the relationship between the structure of space and distribution of energy, the shared dimensional equivalence of quantized gravitational and electromagnetic fields, and the empirical demonstration of an intrinsic entanglement velocity.