The Photon consists of a Positive and a Negative Charge, Measuring Gravity Waves reveals the Nature of Photons

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Abstract

The study displays that the photon consists of a positive charge and a negative charge. A gravitational singularity in the universe generates synchronized, extremely low frequency gravitational waves consisting of extremely low frequency photons. This photon was exposed to a magnetic field resulting in that the photon was split into a separate positive charge and a separate negative charge. These charges were exposed to electric fields, revealing their nature. It is proposed that the photon's positive charge rotates clockwise and the negative charge rotates counter clockwise perpendicular to the photons radial direction forming a double helix. The photon's radial speed is equal to the speed of light. The charge's rotational speed is equal to the photon frequency v. The study describes how the photon's charges were measured. The study describes a method to measure how e.g. an incandescent light bulb and a radio transmitter antenna generate photons, revealing the true nature of photons. The study describes the relationship between photon, gravity and the atom's elementary particles.

1. Introduction

The present study reveilles a novel way to measure the photon's characteristics. The method used is to expose a flow of extremely low energy, coherent and polarized photons to a static magnetic field. The magnetic field splits each photon into its two elementary particles; a negative and a positive charge. The negative or the positive charge is then exposed to an electric field which changes its position. This position is measured using a charge meter described by Giertz (2010). It facilitates measurement of the photon's positive and negative charge as well as important characteristics.

It has been proposed by Giertz (2013) that the universe contains a gravitational singularity called GravitySource. The GravitySource constitutes a gigantic generator emitting photons, and it may consist of circulating charges. According to the photon-wave duality these photons generate plane TEM (transverse electromagnetic) waves with the frequencies 69.9 Hz and 91.9 Hz. In the present paper these photons are called gravity photons. According to this theory the atom comprises EQs (energy quanta) where each EQ consists of two elementary particles; a positive charge and a tightly coupled negative charge forming an electric dipole. The EQ creates resonance with gravity photons and their plane TEM waves. The gravity photon is re-emitted and propagates to another EQ, resulting in mutual force of attraction, i.e. gravity, between the two EQs.

Gravity photons and their plane TEM waves are coherent, polarised and have very low energy due the low photon

frequency. Hence, gravity photons and their TEM waves add linearly resulting in large amplitude TEM field vector amplitudes and where the sum of the photon's charge is high. Consequently, their characteristics are easy to measure.

Aim of the study. The aim of the study is to present and to verify a theoretical model of the photon.

2. Theoretical model of the photon

The present study proposes that the photon consists of a positive elementary charge and a negative elementary charge. The charges are loosely coupled, i.e. they do not form a fixed dipole. The photon's mass is zero. Its charge is the sum of its positive and negative charges, i.e. zero charge. It enables photons to propagate with the speed of light. It is proposed that the positive charge propagates in the radial direction and at the same time it rotates clockwise perpendicular to the radial direction resulting in a helix shaped motion. The negative charge rotates counter clockwise resulting that the two charges propagate along a double helix with the speed of light in the radial direction, Fig. 1. The rotational speed of each charge is equal to the photon frequency v. Rotating charges with frequency v, propagating in the radial direction with the speed of light, generates alternating electric and magnetic fields with frequency v, i.e. plane TEM waves with frequency v.

Note that the negative (elementary) charge is different to the electron which has mass, see section 6.



Fig 1. Photon's charges propagate in a helix.

The photon consists of a positive and a negative elementary charge which propagate with the speed of light, c, in the radial direction. The positive charge rotates clockwise with a rotational speed equal to the photon frequency v, forming a helix in the radial direction. The negative charge rotates counter clockwise with a rotational speed equal to the photon frequency v, forming a helix in the radial direction. The two charges propagate along a double helix in the radial direction.

3. Materials and methods

Experiments 1-3 were performed almost identical to experiments described by Giertz (2013). Experiments 1-3 were performed using two identical devices called EQ. The EQ created resonance with gravity photons and their plane TEM waves which originated from the GravitySource or the earth. Each EQ received gravity photons from e.g. the GravitySource and re-emitted these photons to the other EQ. Each EQ consisted of two neodymium magnets, with diameter 22 mm, spaced by a thin (0.05 mm) plastic foil and where the south pole of one magnet attracted the north pole of the other. This created an internal magnetic field \mathbf{B}_i . One magnet was connected to the positive pole of a voltage source, U, the other magnet to the negative pole, Fig. 2. This created an internal electric field \mathbf{E}_i , e.g. 10^6 V/m at U = 50V. \mathbf{B}_i and \mathbf{E}_i were merged within the thin space between the magnets and could be described as an electromagnetic dipole.



Fig. 2. Generating photons and TEM waves.

Two neodymium magnets, with a diameter 22 mm, were spaced by a thin (0.05 mm) plastic foil with the south pole of one magnet attached to the north pole of the other. This created an internal magnetic field \mathbf{B}_i . One magnet was connected to the positive pole of a voltage source U, and the other magnet to the negative pole. This created an internal electric field \mathbf{E}_i , combined with \mathbf{B}_i . This device, called EQ (energy quantum) received and re-emitted gravity photons and their plane TEM waves. Measurements were performed with the neodymium magnets connected to a 9 V battery, forming a portable EQ, detached from external influence (e.g. AC, ground).

Measurements of plane TEM wave field vector amplitudes and photon charge were made as described by Giertz (2010). That report describes in detail how the position and amplitudes of electric and magnetic field vectors and charge were measured using a charge meter. The charge meter is described in detail. Measurements in the present study were made almost identically to those described previously (Giertz, 2010 and 2013). In summary, the charge meter contained a probe with charge density ρ . The probe was moved, with constant speed, through the TEM wave electric field vectors **E** or the photon's charge q. This resulted in an electric body force $\rho \mathbf{E}$ on the charge ρ . This current pulse was amplified and displayed. This probe was also moved, with constant speed, through the TEM wave magnetic field vectors \mathbf{B} , which resulted in a magnetic body force $\mathbf{J}\mathbf{x}\mathbf{B}$ on current **J** in the probe. In this case **B** was field vectors, implying that $\operatorname{div} \mathbf{B}$ was large and resulted in a distinct current pulse.

A permanent magnet with magnetic field **B** (1 μ T) was inserted within the photon's path. The propagating photon consisted of a propagating positive and a propagating negative charge. The propagating positive charge can be described as a positive current +I in the air. The propagating negative charge can be described as a negative current -I. The force **dF** exerted on an element of current **ds**, carrying a current I in an external magnetic field **B**, is expressed as (Bleaney, 1965):

$$\mathbf{dF} = \mathbf{I}(\mathbf{dsxB}) \tag{1}$$

The magnetic field resulted in that the photon's positive charge was diverted the distance d⁺ to one side and the negative charge was diverted the distance d⁻ to the opposite side. According to (Giertz, 2010 and 2013) it made the TEM wave positive magnetic field vectors \mathbf{B}^+ divert the distance d_1 to one side and the negative magnetic field vectors **B**⁻ divert the distance d₂ to the opposite side. Photons propagating in one direction (e.g. from Source 1 to Source 2) were influenced so that their charge and field vectors were diverted in the horizontal plane, see Fig. 3. Photons propagating in the opposite direction (e.g. from Source 2 to Source 1) were influenced so that their charge and field vectors were diverted in the vertical plane, see Fig. 4. This enabled measurement of the two directions separately. The charges and the field vectors propagated in smooth bows distanced by the magnetic field **B**.

A 1.5 V AA battery was inserted below the diverted negative charge at the position d⁻, shown in Fig 3. The negative pole was directed towards the negative charge and the positive pole was connected to ground. This created an electric field \mathbf{E} on the photon charge q and according to the Lorenz law this created a force \mathbf{F} on the photon charge q (Bleaney 1965):

$$\mathbf{F} = \mathbf{q}\mathbf{E} \tag{2}$$

3

This diverted the photon's negative charge away from the battery pole, i.e. the sum of photon's negative charge (i.e. current) was rotated perpendicular to the radial direction and away from the battery pole. Inserting the battery with its positive pole directed towards the photon's positive charge at the position marked d^+ in Fig 3, rotated the photon's positive charge (i.e. current) away from the battery pole and perpendicular to the radial direction.



Fig. 3. Measuring photon charge, propagating from Source 1.

Two EQs, as described in Fig. 2, Source 1 and Source 2, were positioned at 5 m distance. Source 1 was connected to a 9 V battery and Source 2 was also connected to a 9 V battery. This resulted in photons propagating between the two sources. A permanent magnet **B** was inserted within the flow of photons. Photons propagating from Source 1 to Source 2 were diverted in the horizontal plane. This resulted in that positive charge was diverted the distance d⁺ The positive field vectors were diverted the distance d₁ to the same side in the horizontal plane. The negative charge was diverted the distance d₂ to the opposite side. This enabled separation of the photon's positive and negative charge.



Fig. 4. Measuring photon charge, propagating from Source 2.

Two EQs, as described in Fig. 2, Source 1 and Source 2, were positioned at 5 m distance. Source 1 was connected to a 9 V battery and Source 2 was also connected to a 9 V battery. This resulted in photons propagating between the two sources. A permanent magnet with magnetic field **B** was inserted within the flow of photons. Photons propagating from Source 2 to Source 1 were diverted in the vertical plane. This resulted in that positive charge was diverted the distance d⁺ and positive field vectors were diverted the distance d⁺ and negative field vectors were diverted the distance d⁻ and negative field vectors were diverted the distance d₂ to the opposite side. This enabled separation of the photons positive and negative charge.

This method facilitated separation of the photon's individual parts, i.e. its positive charge, its negative charge, its positive electric and magnetic field vectors as well as its negative electric and magnetic field vectors. It facilitated a method to individually measure and to characterize each of these parts. It enabled measurement of photons propagating in two directions separately.

Note that the method is only possible to use on extremely low frequency, coherent and polarized photons or TEM waves, i.e. gravity photons and on gravity TEM waves as described by Giertz (2013).

Measurements were performed 50 km south of Stockholm, Sweden.

Analysis. The experiments were performed blindly, randomly and repeated 3 times.

4. Results

Experiments 1 to 3 aimed at verifying the theoretical model, presented in the section Theoretical model of the photon. One EQ was positioned at Source 1. Source 2 consisted of one EQ which was located at the distance r = 5 m. Each EQ was connected to a 9 V battery. It produced gravity photons propagating from Source 1 to Source 2 and gravity photons propagating from Source 2 to Source 1. Measurements also displayed the positive and the negative field vectors (plane TEM waves) propagating in each direction. It was also observed that Source 1 and Source 2 received and re-emitted gravity photons and plane TEM waves from and to the GravitySource and from and to the earth (i.e. ground). Hence, the gravity photons originated from these sources. Consequently, the EQs did not generate photons; their only function was to create resonance with gravity photons and their plane TEM waves originating from the GravitySource and earth and to re-emit these gravity photons and TEM waves between the two EQs, Source 1 and Source 2. So far this experiment layout was identical to Experiment 5 as described by Giertz (2013).

Experiment 1. A permanent magnet with magnetic field **B** (1) μ T) was inserted in the path of gravity photons between the two EQs called Source 1 and Source 2 at 2.5 m distance from Source 1. Initially gravity photons propagating from Source 1 to Source 2 were measured, Fig. 3. The magnetic field **B** diverted the photon's positive charge or current approximately the distance $0.2 \text{ m} (d^+)$ to one side in the horizontal plane and the photon's negative charge or current approximately the distance $0.2 \text{ m} (d^{-})$ to the opposite side in the horizontal plane. It also diverted the positive electric and magnetic field vectors approximately 1 m (d_1) to one side and the negative electric and magnetic field vectors approximately $1 \text{ m}(d_2)$ to the opposite side in the horizontal plane. The photon's charge or current propagated in two bows from Source 1 to Source 2. Subsequently, a 1.5 V AA battery was inserted with its positive pole below the positive charge or current at the distance d⁺, i.e. at its maximum deflection. It made the positive charge (current) rotate approximately 30 degrees perpendicular to the radial direction and away from the battery pole. Inserting the negative pole below the negative charge (current) rotated the

negative current approximately 30 degrees perpendicular to the radial direction away from the battery pole. Subsequently, photon's charge and field vectors propagating from Source 2 to Source 1 were investigated. Their charge and field vectors were diverted similar to the above description; however, diverted in the vertical plane, Fig 4. Inserting the battery's electric field **E** resulted in that the charge was rotated.

Experiment 2. Experiment 1 was repeated. However, in this case the experiment was performed on the gravity photons which propagated from the GravitySource to Source 1. The experiment yielded results similar to that in experiment 1, displaying that the photon's charge was diverted by the magnet's magnetic field \mathbf{B} , and rotated by the battery's electric field \mathbf{E} .

Experiment 3. Experiment 2 was repeated. However, in this case the experiment was performed on gravity photons propagating from the ground (earth) to Source 1. The experiment yielded results similar to experiments 1 and 2, displaying that the photon's charge was diverted by the magnet's magnetic field \mathbf{B} , and rotated by battery's electric field \mathbf{E} .

Photons and TEM waves to and from Source 1 and Source 2 ceased immediately when the voltage source, i.e. the battery, was removed from the EQs.

Experiment 4. In this experiment Source 1 consisted of an incandescent light bulb (240 V, 75 W). Source 2 was the GravitySource. The light bulb was switched on and the experiment was allowed to stabilize during 15 minutes. It resulted in that gravity photons (and their TEM waves) propagated from Source 2 to Source 1. Subsequently a permanent magnet **B** $(1 \mu T)$ was inserted in the photon's path at 1 m distance from Source 1. The photon's positive charge or current was diverted approximately 0.5 m (d⁺) to one side and the photon's negative charge or current was diverted approximately 0.5 m (d⁻) to the opposite side. Subsequently, a 1.5 V AA battery was inserted 1 m in front of Source 1 and with its positive pole below the positive charge or current at its maximum deflection. It made the positive charge (current) rotate approximately 45 degrees perpendicular to the radial direction (from Source 2 to Source 1) and away from the battery pole. Inserting the negative pole below the negative charge (current) rotated the negative current approximately 45 degrees perpendicular to the radial direction and away from the battery pole. The inserted permanent magnet and its magnetic field **B**, resulted in that the positive electric and magnetic field vectors were diverted approximately 2 m (d_1) to one side and that the negative electric and magnetic field vectors were diverted approximately $2 \text{ m}(d_2)$ to the opposite side, see Fig 3.

Experiment 5. Experiment 4 was repeated using incandescent light bulbs with power between 25 W and 100 W yielding results similar to Experiment 4. However, the diverted distances d^- , d^+ . d_1 and d_2 as well as the rotational angle were approximately proportional to the bulb power W. Other types of lamps were used (LED, halogen) yielding similar results. A candle was used, yielding similar results as a small power light bulb.

Experiment 6. In the following experiment Source 1 consisted of a halogen lamp (240 V, 50 W) with narrow light cone angle and Source 2 was the GravitySource. The halogen lamp was directed 45 degrees towards the ground and switched on, whereby the experiment was allowed to stabilize during 15 minutes. The charge meter was moved slowly through the light beam, revealing the existence of low frequency, polarized TEM waves propagating along the light beam. Its electric and magnetic field vector amplitudes where measured. Subsequently, the gravity TEM wave that propagated from the GravitySource towards the halogen lamp was measured. The gravity TEM wave amplitude was close to that of the TEM wave amplitude propagating along the light beam.

Experiment 7. Experiment 4 was repeated using a radio transmitter instead of light bulbs as Source 1. A SonyEricsson Experia cellular phone yielded results similar to Experiment 4; however, the diverted distances d^- , d^+ . d_1 and d_2 and the rotational angle were small. Communication radios (Lafayette 27 MHz and ICom 150 MHz) were used yielding similar results.

Switching off the power from light bulbs in experiments 4-6 and switching off transmitters in experiment 7 resulted in that photons and TEM waves from Source 2 (GravitySource) to Source 1 (light bulb or transmitter) were reduced to a significantly lower level, determined by the objects gravity.

5. Conclusions

Experiment 1. This experiment displayed that it was possible to split the photon that propagated between the two EQs, into its individual basic elementary particles. A magnetic field **B** was used in order to split the photon. An electric field **E** was used in order to prove that the photon consisted of positive and negative charge. The experiment also displayed that the photon generated a plane TEM wave and it was possible to measure its positive and negative electric and magnetic field vectors. It is proposed that the rotating charges with rotational speed v, created electric and magnetic fields with frequency v, i.e. plane TEM waves with frequency v.

Experiment 2. This experiment comprised photons propagating from the GravitySource. The experiment displayed that it was possible to split the photon into its individual basic elementary particles. Hence, the photon consisted of positive and negative charge. The results were similar to the results of experiment 1 leading to the proposed conclusion that experiments 1 and 2 involved the same type of photon.

Experiment 3. This experiment comprised photons propagating from the earth. The experiment displayed that it was possible to split the photon into its individual basic elementary particles. Hence, the photon consisted of positive and negative charge. The results were similar to the results of experiment 1 and 2 leading to the proposed conclusion that experiments 1, 2 and 3 involved the same type of photon.

Experiment 4-5. These experiments displayed that light bulbs or a lit candle attracted photons originating from the GravitySource. The number of attracted photons and the sum of their charges and their generated TEM waves (i.e. TEM wave amplitude) was proportional to bulb power W. It is proposed that the light bulbs or the candle did not produce light photons of its own. It is proposed that they attracted gravity photons, originating from the GravitySource. Subsequently, a new energy state, with frequency v, was superpositioned on the photon, whereby the photon was changed into a light photon.

Experiment 6. This experiment revealed that the low frequency content of gravity photons, which propagated from the GravitySource to the lamp, was maintained also in light photons. The following process is proposed. The origin of light photons was gravity photons propagating from the GravitySource to the lamp. The lamp and its high frequency electromagnetic process superpositioned its energy on the gravity photon and hence, the light photon contained the frequency.

Experiment 7. This experiment displayed that the radio transmitter antenna attracted photons originating from the GravitySource, similar to the light bulbs in experiments 4 and 5. It is proposed that the radio transmitter antenna did not produce radio photons (i.e. photons with radio frequency (27 MHz, 150 MHz or 1.8 GHz) on its own. It is proposed that the antenna (i.e. its electromagnetic fields) attracted gravity photons, originating from the GravitySource. Subsequently, a new energy state, with frequency v, was superpositioned on the gravity photon (as explained in experiment 6), whereby the photon was changed into a radio photon and which generated a plane TEM wave with radio frequency 27 MHz, 150 MHz respectively 1.8 GHz in this experiment.

6. Discussion

The theory of photons, gravity and the atom's elementary particles are tightly linked. All three must be explained in the same context in order to gain a proper understanding. A theory of gravity and the atom's elementary particles has been presented by Giertz (2013). It is a prerequisite to read that paper.

Here a theory is proposed which incorporates the photon, gravity and the atom's elementary particles.

It is proposed that the universe consists of only two basic elementary particles; a positive charge and a negative charge.

The photon consists of one positive charge loosely coupled to a negative charge and the charges propagate in the radial direction along a double helix, whereby the photon's total charge is zero. The photon frequency v, i.e. its energy, is equal to the charges rotational speed (with frequency v). This motion generates electric and magnetic fields, i.e. a plane TEM wave. The GravitySource generates gravity photons with frequency 69.9 Hz and gravity photons with frequency 91.9 Hz (Giertz, 2013).

A positive charge, tightly coupled to a negative charge, constitutes an electric dipole, called EQ (energy quantum) (Giertz, 2013). The atom consists of many EQs and each EQ creates resonance with gravity photons and re-emits gravity photons without changing their content. The flow of gravity photons, propagating in opposite directions between two EQs, creates mutual force of attraction between gravity photons of equal frequency, i.e. between photons with frequency 69.9 Hz and between photons with frequency 91.9 Hz. The mutual force of attraction between gravity photons, propagating in opposite directions, results in that gravity photons accelerate until maximum speed is obtained (i.e. the speed of light, c). This explains why photons propagate with the speed of light. Gravity photons, propagating in opposite directions between two EQs, create mutual force of attraction between the two sources, i.e. the EQs and which is called gravity or gravitational force.

Objects (i.e. light bulbs, candle and radio transmitter antennas) do not generate photons on their own. They attract gravity photons and their electromagnetic energy is superpositioned on these photons. As an example the 27 MHz transmitter antenna and its electromagnetic energy attracts a gravity photon with frequency 69.9 Hz (or 91.9 Hz) and its energy is superpositioned on the photon, whereby the radio photon energy is described by its frequencies 69.9 Hz and 27 MHz (or 91.9 Hz and 27 MHz). The radio photon continues to propagate with its initial speed, i.e. with the speed of light. Eventually the radio photon is absorbed by matter resulting in that its energy with frequency v = 27 MHz is dissipated as e.g. heat. The photon's energy is now reduced to its initial energy, i.e. a gravity photon with frequency v = 69.9 Hz (or 91.9 Hz). An adjacent EQ (in an atom) can create resonance with this gravity photon resulting in that the gravity photon contributes to gravity. Hence, gravity photons are generated by the GravitySource and then they circulate in the universe and change energy state from e.g. gravity photon to light photon, back to gravity photon, then to radio photon and then back to gravity photon etc. This change of state results in that photons continue to propagate with the speed of light.

It has been proposed by Giertz (2013) that the atom comprises EQs (energy quanta) where each EQ consists of two elementary particles; a positive charge and a tightly coupled negative charge forming an electric dipole. This EQ creates resonance with photons and their plane TEM waves, radiated by the GravitySource, and re-emit these photons to other EQs resulting in mutual force of attraction, i.e. gravity, between EQs. Consequently, the EQ's dipole has electric and magnetic fields, electric and magnetic dipole moments, it generates gravity and it has gravitational mass and inertial mass. Positioning two dipoles side-by-side; however, in opposite direction results in a very strong electromagnetic force (Coulomb force) and also gravity which fuses the two dipoles. More dipoles can be added forming a matrix. Such configuration can result in a quark and various configurations result in various types of quarks. Amalgamated quarks result in baryons, e.g. neutron. A proton is created when a positive charge is added to one dipole in a neutron. An electron is created when a negative

charge is added to one dipole in a small configuration of dipoles (e.g. a dipole with one positive charge and two negative charges). The sum of these particles is the atom. The forces acting between dipoles and configurations of dipoles, within the atomic nucleus, will be described in a separate paper.

Consequently, the universe consists of two basic elementary particles; positive charge and negative charge. These charges create two elementary particles; the photon and the EQ. The photon consists of a positive charge loosely coupled to a negative charge. The photon has mass equal to zero. The photon in itself has no (or extremely low) energy due to the loose coupling between its charges. The photon's frequency v and its energy are determined by the rotational speed of its charges and which rotate with the frequency v. The photon is a quantum, defined by its positive and negative charge.

The EQ consist of a positive charge tightly coupled to a negative charge forming a dipole. The EQ has high energy due to the tight coupling between its charges. A high energy photon, e.g. gamma radiation, is emitted when this bond is broken. Hence, the tightly coupled charges in the dipole are separated and configured into loosely coupled charges, i.e. a photon, where the photon energy is equal to the energy stored in the dipole. EQs create resonance with gravity photons whereby each EQ attracts and re-emits gravity photons. Hence, the EQ is exposed to gravity resulting in that the EQ has gravitational mass and inertial mass. The EQ is an energy quantum described by its two charges, i.e. the dipole.

The overall conclusion is that the universe consists of only positive and negative charge, where the photon is one quantum and the EQ's dipole is another quantum. Configurations of charges and their motions create electromagnetic fields and forces according to the laws of electromagnetism and quantum physics.

State of the art elementary particle physics and astrophysics is burdened by unsolved issues. It is of course impossible to correctly define these scientific disciplines when their fundaments are poorly understood or not understood at all. Elementary particle physics is hampered by the undefined photon, the undefined gluon, the undefined graviton, the undefined strong force, the undefined weak force and the poorly defined elementary particles having undefined colour confinement. Astrophysics is hampered by the undefined cosmological constant, the undefined dark energy, the undefined expanding space paradigm, the undefined frame dragging, the undefined gravitational radiation, the undefined orbital decay, the undefined ripple in the metric of spacetime, the undefined gravitational redshift, the undefined gravitational lensing and the undefined black hole.

The present study and Giertz (2013) may contribute to a better understanding of these scientific disciplines.

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