

What is a graviton ?

Based on the Finnish original (Mikä on gravitoni ?) in Sähkö & Tele 1/(2008) pp. 63...66.

This article explores the structure and traits of gravitons, and how they can break down into two photons or fundamental elementary particles - the "building blocks" of atoms. In addition, it seems highly likely that gravitons may be created as photons collide, which means that a balanced cycle of matter and electromagnetic radiation is an essential part of nature's great symmetry.

A graviton is a ring-like particle

The speed of light gives us clues about gravitons, when we assume that at their weakest they can be slender, ring-shaped particles formed out of electricity and magnetism that appear around our universe and whose peripheral velocity is the speed of light. This leads us to the following set of equations: $c^2 = 1/(\epsilon_0 \mu_0) = 4\pi^2 n^2 r^2$, where c is light speed in a vacuum, ϵ_0 the permittivity of a vacuum, μ_0 the permeability of a vacuum, n the spinning frequency of a graviton and r its radius.

If a graviton's energy is, according to Planck's law, directly proportional to its spinning frequency, we arrive at the equations: $E = h n = m c^2$, where h is the Planck's constant and m the graviton's apparent mass.

The angular momentum of a ring-like graviton can be derived from the following equations: $L = \omega J = 2\pi n r^2 m$, where $J = r^2 m$ is the graviton's moment of inertia, and $\omega = 2\pi n$ the angular velocity of the moment of inertia.

When the angular momentum found in this manner is multiplied by half of the angular velocity, we can find the energy captured by the moment of inertia of a graviton spinning at speed of light from the equation $E_J = 2\pi^2 n^2 r^2 m$, from which follows $E_J = m c^2 / 2 = h n / 2$ and $E_c = m c^2 / 2 = h n / 2$.

Based on this examination the energy of a graviton spinning at peripheral velocity c is divided into two equal parts, the energy coupled to the spinning movement of a graviton's moment of inertia E_J , and its transverse energy E_c , the energy coupled to graviton's apparent mass and its tangential movement at light speed c .

Alternatively, the graviton's energy can be divided into electrical energy E_ψ , and its orthogonal complement E_ϕ , the graviton's magnetic energy.

The limit of mass potential

Our assumed graviton may settle in a state of equilibrium around the universe. This is described by $MG/r^2 = c^2/r$, M where is the mass of the universe and r its radius, and also simultaneously the radius of the graviton in question. With help of this state of equilibrium we can find $M/r \leq c^2/G \approx 1.3468 * 10^{27} \text{kg/m}$, where the natural constant c^2/G is the limit value of the mass potential M/r . It is important to observe that this natural constant is

independent of time. Therefore any material starts to collapse and emit electromagnetic radiation if the limit $M/r \approx 1,3468 \cdot 10^{27} \text{kg/m}$ is reached.

The upper limit of spinning frequency

If a graviton stops its spinning during a single spin, we can deduce the average of the released power pulse from $P = nm c^2 = hn^2 = \Psi \Phi n^2 \leq c^5/G$, where Ψ is the electric part of Planck’s constant i.e. its electric flux and Φ its magnetic part i.e. its magnetic flux. The quantity $c^5/G = 3.62884743 \cdot 10^{52} \text{ W}$ is a natural constant that describes the greatest average of released power pulse during a single spin of a graviton, reference [1].

The limit of mass growth

If the radius of a graviton existing in the sphere in influence of the universe decreases, its peripheral velocity may remain at light speed, and its spinning frequency may increase. This can be seen from the equation mentioned above: $c^2 = 4\pi^2 n^2 r^2$. Based on the equation of power, we can also find:

$dm/dt = P/c^2 = nm \leq c^3/G$, which shows the significance of an increase in spinning frequency of a graviton.

In the situation $(nm)_{\text{max}} = c^3/G$ and $(n^2)_{\text{max}} = c^5/(Gh)$ a graviton must always break down. It does not turn into a "black hole", but rather a "bomb", that "shatters black holes".

The natural constant $\pm c^3/G = (nm)_{\text{max}} = (dm/dt)_{\text{max}}$ is the limit of mass growth or, just as well, the limit of mass loss.

Also $dM/dt = P/c^2 = HM \leq c^3/G$ holds, where H is Hubble’s constant, derived from $H = c^3/(GM)$.

As gravitons break down, photons may form

Figure 1 uses a slender ring of electricity and magnetism, with a peripheral velocity of light speed, to describe a graviton breaking down. The entire energy of the described graviton can be derived from $E_g = hn_g = 2 E_p = 2hn_p$, from which follows $n_g = 2 n_p$. The apparent mass of a graviton can be derived from $m_g = hn_g/c^2 = 2hn_p/c^2 = 2m_p$, from which follows that $m_g = 2m_p$. In these equations the subscript g refers to a graviton and p to a photon.

As a graviton breaks down into two photons, the spinning frequency of the created photons is always half the spinning frequency, and their apparent mass half the apparent mass of the original graviton.

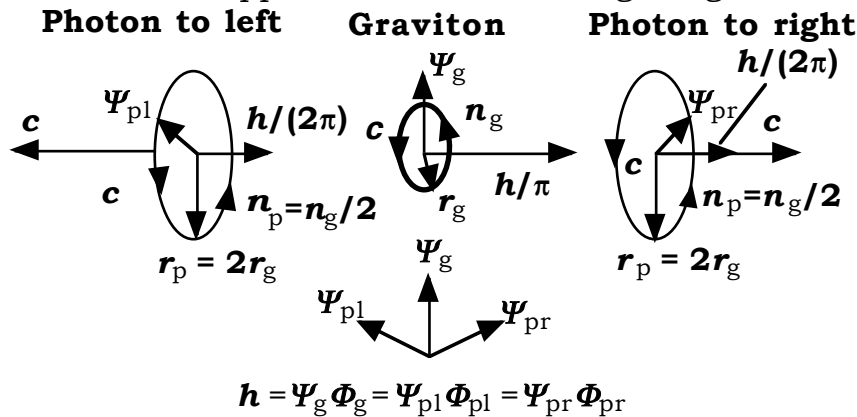


Figure 1. The breaking down of a graviton into two photons.

As a graviton breaks down into two photons, the created photons move off in opposite directions at light speed from the breaking point. Based on the law of preservation of spin, the sum of the spin vectors of the created photons is equal to the spin of the original graviton. This is possible, if the angle between the flux vectors of the departing photons and the graviton's flux vectors is $\pi/3$ radians i.e. 60 degrees. Figure 1 shows the graviton's spin vector h/π , as well as the spin $h/(2\pi)$ of the departing photons.

The direction of all spin vectors are from left to right. Of flux vectors, only the graviton's electric flux vector Ψ_g and the electric flux vectors Ψ_{pl} and Ψ_{pr} of the created photons are shown.

The line of equations: $\mathbf{h} = \Psi_g \Phi_g = \Psi_{fl} \Phi_{fl} = \Psi_{fr} \Phi_{fr}$, uses Planck's constant to tie together the fluxes of the breaking-down graviton and the created photons.

The spin and energy of a graviton

According to latest textbooks, a graviton's spin is $L_g = h/\pi$, which is double that of a photon, reference [3]. The total energy of a graviton can be derived from $E_g = \pi n_g h/\pi = h n_g = m_g c^2$.

This is an entirely correct result, but inaccurate, because Einstein's famous formula $E = m c^2$ does not explain that the energies of a photon moving at light speed and a ring-shaped graviton having the speed of light as peripheral velocity must contain two orthogonal types of energy. If the energy of these particles is in electromagnetic form, it is easy to understand the inaccuracy of Einstein's formula, because electromagnetic radiation energy always contains an electric part and orthogonal magnetic part. Based on electromagnetic theory, these orthogonal parts are necessary to each other. They are equally important to gravitons and photons. They are also important to understand the "secret knowledge" contained in Einstein's formula.

In this article, the duality was revealed at the outset, as graviton described with a mass ring, and the equations $E_J = m c^2/2$ ja $E_c = m c^2/2$ were found, where E_J described the energy captured by a graviton's moment of inertia and E_c the energy that remained in the graviton's peripheral velocity's part.

With the help of the spinning movement of the moment of inertia, a graviton is able to maintain the direction of its axis in the "desired" position, because a change of the direction of a graviton's axis does not succeed without work.

The same "principle" applies to a photon in a spinning particle state, but it strives to maintain its course stable using the spinning movement of the moment of inertia.

Entropy increases as gravitons break down

Based on figure 1, it therefore seems that as a graviton breaks down, photons - that is electromagnetic radiation - may form. The described process signifies a decrease in the spinning frequency and increase in wavelength of the created particles, i.e. photons and other possible particles. At same time, it signifies a decrease in systemic temperature and increase in systemic entropy, and also that the creation of gravitons in for example "head-on collisions" of photons obviously does not happen without losses. However, these losses do not render the creation of gravitons impossible in for example the event of collision of two photons, but the probability of such an event can be very small.

Conjugated graviton

The greatest spinning frequency of a graviton can be derived from $n_{g\max} = [c^5/(Gh)]^{0,5} \approx 7.40035 \cdot 10^{42}$ Hz, therefore its energy can be derived from $E_{g\max} = h n_{g\max} \approx 1362$ kWh. As these figures are compared to the spinning frequency $4.54 \cdot 10^{23}$ Hz demanded by conjugated graviton described in figure 2, we notice that as the photons and gravitons in the universe around us break down, they are capable of producing all elements and parts of atoms that can be found on planet Earth.

The production capacity of hydrogen atoms required in order to ensure a constant cycle of matter and radiation in an Earth-sized volume is only approximately 10 micro watts, reference [1 p. 90].

Finding out the different ways a graviton can be created in any great extent is such a laborious task that it will be left outside this article. The most important thing to know is that as gravitons break down, electromagnetic radiation and different particles of matter can be created.

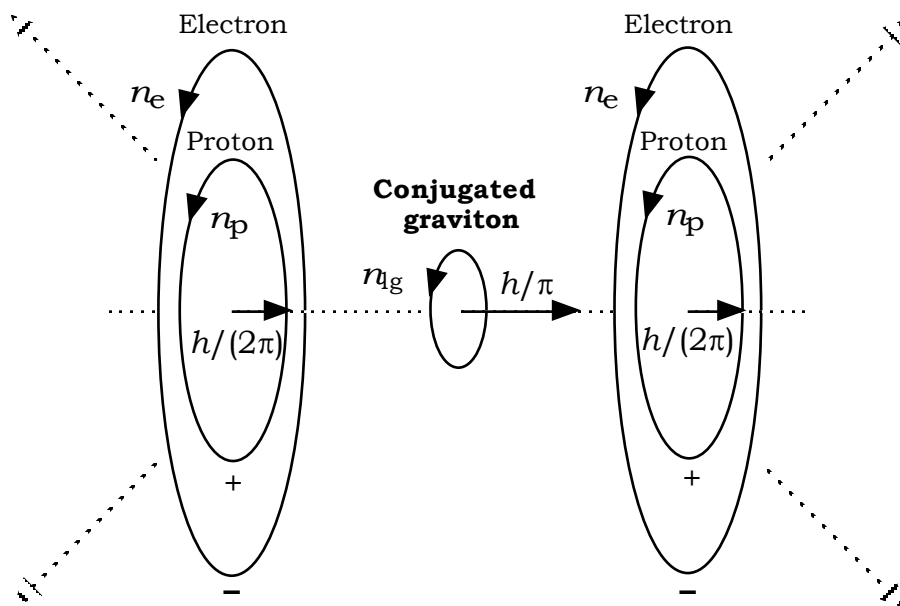


Figure 2. A conjugated graviton can produce matter as it breaks down.

If the spinning frequency of a graviton increases enough, it may create two electrons and two protons as it breaks down. The spinning frequency of a conjugated graviton required to perform the described breaking-down process is at least $4,54 \cdot 10^{23}$ Hz, which is has been derived from $n_{lg} = 2c^2 (m_p+m_e)/h$, where m_p is the mass of a proton and m_e the mass of an electron. As is well known, stars are able to create helium out of two hydrogen atoms, which in turn releases a lot of energy.

Epilogue

Using well-known natural constants, the above has managed to show that the universe around us seems to be a great "black bubble", inside which the collisions of photons may create gravitons, which, as they break down, can create photons and elementary particles to build a variety of matter. Gravitons and photons are mediating particles that are extremely important to ensure a balanced cycle of mass and radiation.

The greatest discharge power of the energy of photons and gravitons is $c^5/G \approx 3,6 \cdot 10^{52}$ W. This power tightly couples electromagnetic forces with gravity.

The electromagnetic explosive forces corresponding to this coupling cannot be overcome by any "black hole".

"Black holes" and the "Big Bang" theory seem to be based on an inadequate interpretation of Einstein's formula $E = m c^2$ and a lack of sufficient knowledge of the "very close relation" between gravity and electromagnetic forces.

Hopefully, someone under the spell of by "black holes" and "The Big Bang" will some day read this article.

References

[1] Hassi, O. : Fotonin malli, Tampereen teknillisen yliopiston erikoisjulkaisu, ISBN 952-15-1004-8, Tampere 2003, 114 sivua. (Photon model, a special publication of Tampere University of Technology, 2003, 114 pages).

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