On The Gravity

(the "Rainbow Particle" theory) v.7

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Abstract: This paper presents an unconventional view on the gravity force and the way it manifests in particle interactions via a newly-introduced particle; introduces the "energy density function" of this particle and the way it affects the surrounding particles by its physical field.

I

This paper assumes that the gravity is a force exhibited by a particle called "graviton". While not universally accepted and not strictly defined to date, the name "graviton" is quite easy to associate with the gravity. In the long run, the definition of "graviton" may change while the association of the name "graviton" with the gravity won't probably change ever. This paper introduces a new understanding of what "graviton" is in several simple steps, describes its detectable electromagnetic energy spectrum and shows how graviton's gravity field influences surrounding particles, as shown by a law of motion in differential equations.

In order to define what graviton is, it is necessary to make a certain axiomatic assumption: the energy level (in J) of a particle changes in an impulse manner, but not instantly. When the first given particle's energy level increases, the energy is transferred to that particle from the second given particle. If the first particle's energy level decreases, the energy is transferred to the second particle, or is radiated out. But right before coming into the full contact with the second particle and getting or losing the energy, the first particle is initially placed at a certain distance from the second particle, and thus the first particle has to "travel" this additional distance. This distance is called the "transient distance".

In the simplest case, on a 2-dimensional plot, we can set the positions of these two given particles on the X axis symmetrically around x=0 (with x=0 position being in-between two particles), and put the cumulative energy level change of the first particle on the Y axis. We may use a suitable "step function" in the form of cumulative distribution function of the Gaussian distribution ($f_{ec}(x)=\Delta E/2*(1+erf(x/sqrt(2*\sigma^2)))$) J (1) to approximate the first particle's energy level change over the transient distance: it approaches zero at the initial position x_1 (e.g. x_1=-2) of the first particle, and approaches ΔE at the position x_2 (e.g. x_2=2) of the second particle (ΔE is the total energy level change of the first particle, σ depends on the transient distance). The farther the first particle has travelled from its initial position towards the second particle along the transient distance, the larger the cumulative energy level change of the first particle is.

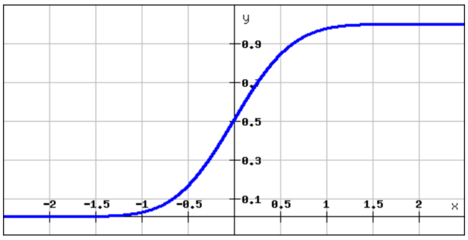

Figure 1: $y=f_{ec}(x)/\Delta E$, $\sigma=0.5$

The exact value of ΔE and the energy level change of the second particle depend on the states and interactions of and between the particles, and this is out of the scope of this paper. However, the energy level change of the second particle changes in a manner similar to the first particle, in a step function manner, and the paragraphs above can be formulated as if the second particle is getting the energy from the first particle, or is losing it.

The approach presented in this paper is similarly applicable to both kinetic and potential energies: ΔE can be either kinetic or potential energy level delta. However, as will be shown below, this paper promotes a view that gravity field is not an abstract potential well making the use of potential energy redundant (still, the potential energy of a particle can be contained in another, non-spatial, domain and expressed as a state vector, or frequency as in the case of photon). The integration domain of the function (1) can be generally chosen arbitrarily instead of the “meter” for spatial domain as used in this paper.

Such treatment of particle’s energy level change is quite different to the one commonly used in physics now: commonly it is assumed that particle’s energy level changes instantly and does not require introduction of any “transient distance” step function (e.g. commonly a change of energy of an atom is treated as discontinuity). In reality, it is reasonable to assume that the energy is transferred to or from the particle during some span of distance or time, not instantly.

II

The aforementioned step function (1) integrates the Gaussian probability density function ($f_{ed}(x)=\Delta E*\exp(-x^2/(2*\sigma^2))$ / $\mathrm{sqrt}(\pi*2*\sigma^2)$) J/m (2), which is also called a “delta function”. If mapped over the Y axis, the function (2) shows the magnitude of the first particle’s energy level change over the transient distance, with such magnitude being maximal at x=0, right in-between the initial positions of two particles. Such “energy level change over the transient distance” is vital to introduction of a new particle: the function (2), without the ΔE multiplier, can be viewed as representing the spatial probability density function of a new particle. The function (2) itself is equivalent to the “energy density function” of this particle, although this concept may be somewhat new. In the essence, this new particle represents the energy which the first particle loses or gains, with this energy spread over an area of space between two particles. In other terms, the “energy density function” is the spectral convolution of the spectral energy line by the spatial probability density function.

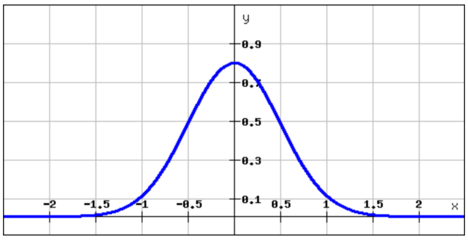

Figure 2: $y=f_{ed}(x)/\Delta E$, σ=0.5

This new particle is what this paper presents as graviton. The graviton is a particle which may be detected directly: it may manifest itself as a real physical particle with its specific energy spectrum. In cases when the energy of this particle is fully contained within a certain particle-interaction system, the graviton is treated as a virtual particle. In a free-standing formulation in 3-dimensional space, the "energy density function" of graviton is equal to:

$E_{gf}(x, y, z)=\Delta E*A*\exp(-((x-x_0)^2/(2*\sigma_x^2) + (y-y_0)^2/(2*\sigma_y^2) + (z-z_0)^2/(2*\sigma_z^2)))$ J/m^3 (3). Where point (x_0, y_0, z_0) is the center of graviton in space; ΔE – graviton's energy (particle's gained or lost energy); A – coefficient of energy proportionality; σ_x, σ_y, σ_z are coefficients of spatial proportionality, collectively they define the energy density symmetry, and may not be equal to each other, leading to an anisotropy and non-symmetry of the gravity force which can be hypothesized. In the simplest case, when the gravity force is isotropic, the "energy density function" of graviton is equal to:

$E_g(x, y, z)=\Delta E*A*\exp(-((x-x_0)^2 + (y-y_0)^2 + (z-z_0)^2)/B)$ J/m^3 (4). Where B is the coefficient of spatial proportionality.

III

Various energy transfers between particles, their acceleration and deceleration included, can be mediated via gravitons. In most cases this will be redundant due to a high locality of energy transfers between particles, but in some cases such mediation is a requirement. It is known that in a particle accelerator a particle that quickly reduces its velocity in an electromagnetic (EM) field produces EM radiation known as Bremsstrahlung – a braking radiation. Bremsstrahlung is such case when a graviton is involved.

In order to validly equate graviton's EM spectrum to a measurable Bremsstrahlung spectrum, it is important to note that the Fourier transform energy spectrum of (1) on the log scale falls by ~log(0.5)=~-0.6931 per doubling of the frequency (or "per octave"), fig.3, and is non-zero though not infinite on the linear energy spectrum scale, at zero frequency. Bremsstrahlung exhibits a similar spectrum near zero frequency, and so the Fourier transform of (1) can be used as a model of Bremsstrahlung EM spectrum up to a certain cutoff frequency (e.g. X-ray frequency). In simple terms, this means that the lower part of graviton's energy spectrum has the energy spectrum of Bremsstrahlung from zero to up to X-ray frequency. The higher part of graviton's energy spectrum is the spectral convolution of X-ray energy lines by graviton's spatial probability density function. Note that a lot of contemporary papers on Bremsstrahlung do not measure spectrum down to zero frequency and are satisfied with the X-ray part of the spectrum. The papers in the field of plasma physics are more likely to contain the full Bremsstrahlung spectrum, from zero frequency and up.

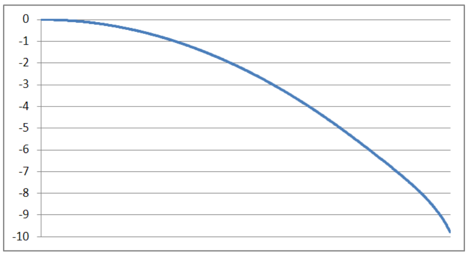

Figure 3: Normalized **log** energy spectrum of graviton near zero frequency (equals 0 at zero frequency). This figure only shows the approximate slope on a linear frequency scale (horizontal axis).

This theory assumes that the X-ray energy emitted during Bremsstrahlung is a cascade effect of particle acceleration or deceleration, with the primary cause being the lower part of graviton's energy spectrum. X-ray energy is the unabsorbed part of graviton's energy which may be absent if X-ray energy was fully absorbed, or if only a small kinetic energy change occurred. The lower part of graviton's energy spectrum stays in a "leverage ratio" to its higher part: while ΔE in equations (3) and (4) includes the full energy spectrum, the lower part of graviton's energy spectrum may be only a fraction of this full energy spectrum. Hence, in the general case ΔE can be represented as $\Delta E=\Delta E_l+\Delta E_h$, where ΔE_l is the lower part and ΔE_h is the higher part (including the X-ray frequencies) of graviton's energy spectrum (ΔE_h is calculated in the spectral domain). The "leverage ratio" $\Delta E_h/\Delta E_l$ (with ΔE_l always being a scalar value) depends on the specific particle interactions, and can be the function of ΔE.

Hypothetically, ΔE_h is oscillatory and equals to some sort of sinusoidal function (or a sum of functions) on the complex plane; at the same time it can be hypothesized that if ΔE_l is zero, equations (3) and (4) represent the "energy density function" of a photon, making it unable to directly affect kinetic energy of other particles in spatial domain. On the macroscopic scale, ΔE_h is usually equal to zero due to statistically-based absorption.

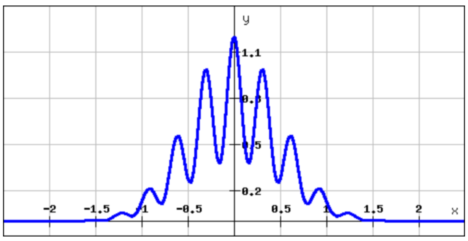

Figure 4: $y=f_{ed}(x)$, $\Delta E=1+\cos(x*20)*0.5$, $\sigma=0.5$
A free-form example of graviton's "energy density function" in the case of X-ray Bremsstrahlung.

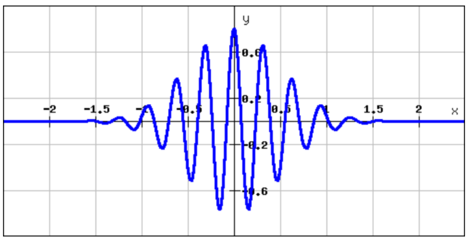

Figure 5: $y=f_{ed}(x)$, $\Delta E=\cos(x*20)$, $\sigma=0.5$
A free-form example of "energy density function" of a photon, $\Delta E_l=0$.

IV

A new important concept in relation to graviton and its energy at zero frequency is the induction of displacement in the surrounding particles. If we take some particle that oscillates around its parametric center in a sinusoidal manner, we can measure the frequency of such oscillation: it can be any value except zero. In the case of Fourier transform of (1) the estimated energy spectrum reaches zero frequency. Presence of energy at zero frequency is what puts graviton into a special position among particles. The energy at zero frequency induces displacement in the surrounding particles, in a progressive, non-oscillatory manner.

In the essence, such displacement function of graviton creates a physical (gravity) field around it.

When some particle P with the given coordinates and the kinetic vector-energy E_p (relative to this field's kinetic vector-energy) is put into this field, it begins to gain energy ($E_p' = E_p + \iiint E_g(x, y, z) * V_g(x, y, z) * D_p(x, y, z)\, dxdydz$) J (5) from this field, over particle's path (see below for continuous-time integral formulation); the triple integral's range includes the area surrounding the particle. $E_g(x, y, z)$ is the equation (3) or (4), or similar in sense (e.g. a macroscopic variant that integrates individual gravitons of a large body). The scalar function $D_p(x, y, z)$ is proportional to particle's spatial probability density function and bounds it in space. If the field moves relative to a particle, the equation (5) is also applicable, and such situation must be seen as a part of the "inertial drag effect", see below.

On the macroscopic scale, the vector field function $V_g(x, y, z)$ is equal to the unit vector pointing from (x, y, z) to the center of this field plus an energy-proportional perpendicular vector of angular momentum of the macroscopic field, but on the microscopic (particle) scale the function $V_g(x, y, z)$ is equal to scalar value 1 and may be omitted. The reason V_g equals 1 on the microscopic scale is because function (2) will be otherwise discontinuous with its integral equal to zero; another reason is that zero frequency has no arbitrary phase in spectral domain and thus there is no way to express its phase or angle. The reason V_g on the macroscopic scale is the said vector field is due to empirical data: the fact that bodies fall down along perpendicular to the ground, and the fact that geodetic effect was measured, but there can be also statistical reasons for this, and reasons associated with a possible existence of the "inertial drag effect", see below.

The field performs work by displacing this particle P. Since the gain of energy by the particle in this field is a persistent, cumulative process, the field accelerates or decelerates the particle until all energy of the field was transferred to the particle. If ΔE in $E_g(x, y, z)$ includes only an oscillatory member (photon case), the net displacement of the particle in such field will lean towards zero, hence photon has net zero gravity field, but has an oscillatory "energy density function".

It can be hypothesized that the calculation of dynamics of a particle under the influence of several overlapping gravity fields can be performed simply by summing kinetic vector-energy differentials of gravity fields at particle's position, as in equation (5), as separate terms. The non-linear effects usually attributed to the gravity force like redshift and time dilation can be a result of the energy gain equation (5) and do not need any specific modeling.

V

On a macroscopic scale, the "energy density functions" (3) and (4) and the energy gain equation (5) must include additional multiplier members to scale up to the macroscopic numbers of particles, which is usually "mole" or "mass". It can be hypothesized that gravity field's strength of a large massive body at a given point is proportional to its "energy density function" divided by its mass: $Z=J/(kg*m^3)=m^{-1}s^{-2}$. This identity multiplied by a plane area (m^2) yields m/s^2 which is field's plane area acceleration at the given point. The equation (5), when transformed into a continuous-time kinetic vector-energy integral, is best expressed as integral of gravity field's "energy density function" E_g (proportional to Z*mass, which is by coincidence equivalent to pressure in Pa) multiplied by vector field V_g of this field, over particle's <u>weighted</u> plane area (expressed as 2-dimensional probability density function perpendicular to particle's kinetic vector-energy) and integrated over distance, with the distance differential depending on particle's kinetic vector-energy integral minus field's kinetic vector-energy (see fig.6 for 1-dimensional example with field's kinetic vector-energy equal to 0). The (average) plane area of a large massive body is proportional to its mass (A=mass/density/meter), but, specifically, it is equal to the sum of integrals of weighted plane areas of all its subatomic particles (weighted plane area spatially "dissects" a particle in two halves by 2-dimensional probability density function).

The following system of 2 differential equations models a "body-gravity field" interaction considering gravity field is created by a much larger body. If two bodies of comparable masses are interacting, this system obviously requires two additional similar differential equations dP_f/dt and dE_f/dt to include the law of motion of another mass.

$dP/dt=vel(E_p-E_f,M_p)$

$dE_p/dt=(\iint E_g*V_g*D_p dA)|dP/dt|$; where dP is body's position differential, vel() – velocity function of body's kinetic vector-energy integral E_p and mass M_p (can be relativistic), E_f –field's kinetic vector-energy, dE_p – body's kinetic vector-energy differential, $\iint dA$ – body's plane area integral, centered at body's position P and rotated in a way to be perpendicular to body's kinetic vector-energy integral E_p, dt – time differential. |dP/dt| means that the energy gain on a microscopic (particle) scale does not depend on body's (particle's) and field's kinetic vector directions, but only depends on the travelled distance.

The identity $Z=m^{-1}s^{-2}$ itself balances the perceived length of "meter" and duration of "second" inside a given macroscopic gravity field as seen by an observer that stays on a periphery of this field with the strength of 1. For example, if gravity field's strength Z at the given position is equal to 4 ($m^{-1}s^{-2}$), equating "m" to 1 (meter), we get s=sqrt(1/4)=0.5s, which means 2 times shorter perceived duration of a second <u>on a macroscopic scale</u> within this field by an observer on periphery, the larger the scale, the more apparent the time scale change is, the time scale change may not be so much pronounced on a microscopic (particle) scale. The value of Z is probably unique for each atomic element, and in such case it can be called as "specific gravity field strength of an atomic element".

VI

Note that the term "mass" may not be an ideal term as far as gravity fields are concerned: an atom we call "massive" gains energy during a free fall in a gravity field faster than a lighter atom (accelerations of both atoms are equal while the masses are different), but it can be hypothesized that in a free-standing case the heavier atom may not have a gravity field proportional to its free-fall mass. It can be also hypothesized that gravity fields can be generated at will by electro-magnetic devices. Hence, the use of a known "mass" multiplier may be precise only in some cases as far as gravity fields are concerned. Unfortunately, today there may be no better alternative to "mass" since no publicly available and universally-accepted gravity field measurement method exists yet. It is a hope of the author that this paper gives an idea for such measurement method.

It should be also noted that the latest research of cosmic-scale redshift quantization concluded that such quantization does not exist. This fact is important, because energy gain formula (5) allows for non-quantized energy gains by particles, including photon.

VII

Given the overall description of the graviton above, it can be hypothesized that for an atom to have a stronger gravity field its subatomic particles have to travel in elliptical orbits, with the periods of deceleration and acceleration that lead to creation of gravitons. Thus, on subatomic level the gravity field may not be constant and may manifests itself as impulse trains that also contribute to atomic decay (meaning fast-decaying atoms and plasmas may have a greater gravity field). EM radiation of pulsars, the double-star systems, may be an example of such graviton Bremsstrahlung impulse trains on a cosmic scale.

It can be also hypothesized that a particle with kinetic energy is actually "carried forward" by a leading graviton placed at a certain distance from particle's center or at its center, along its kinetic energy vector, with graviton's delta energy equal to particle's kinetic energy. In free space, such "particle carried by a leading graviton" forms a dynamic kinetic system that exhibits no acceleration and no Bremsstrahlung radiation. In the essence, the kinetic energy of a particle can be represented as its additional gravity field that may interact with other particles via equation (5). This hypothesis leads to a hypothesis of "inertial drag effect" meaning that a particle with a considerably high kinetic energy drags a slower particle placed at a small distance from it by non-electromagnetic means (note that the photon having its ΔE_l=0 has no kinetic energy in terms of this paper while its potential energy is "conserved" as its frequency, which may undergo a shift in the vicinity of such fast particle). The drag on microscopic (particle) scale may not necessarily appear to be along the kinetic vector of the faster particle, and so the kinetic vector of the slower particle (or photon) may be preserved. The "inertial drag effect" of a macroscopic-scale field may be vector-adjusted. Since photon has zero net gravity field, it cannot exhibit this “inertial drag effect”, and thus it can be said that photon has no kinetic energy.

Several particles that have a nearly equal kinetic vector-energies and that travel in space in an equidistant and unidirectional train formation, one after another along the same directional vector, tend to group with each other over time due to mutual energy loss and gain like via the equation (5), via the “inertial drag effect”. This may explain why repetitive oceanic waves in the deep ocean tend to form rogue waves, and why acoustic waves tend to form shock waves over time. It can be hypothesized that a similar “particle train” (“^{1}H train” or “^{2}H train”) method can be utilized to perform an energy-efficient, low-energy fusion, with the parameters such as frequency of particle firing and particle initial kinetic energy being chosen to be the most economically-efficient.

During the time when graviton lives, the energy that this graviton has can be absorbed by any third particle. This is what a macroscopic gravity field demonstrates. This macroscopic gravity field is a sum of graviton fields of particles of a macroscopic body. Any particle that passes nearby this field absorbs the energy of gravitons of this macroscopic field. An opposite is also true: a moving field causes a particle to absorb the energy of gravitons, thus contributing to the “inertial drag effect”.

If required, the equation (1) can be expressed via the Heaviside step function and the equation (2) can be expressed via the Dirac delta function (with its “a” parameter controlling the “transient distance”). Other similar in sense step and delta function pairs can be used for better approximations.

Graviton, having mostly a continuous spectrum and also due to the shape of its spectrum near zero frequency can be called the “rainbow particle”.

VIII

This theory assumes that only <u>statistical</u>, non-physical, space-time curvature exists and that gravity is not propagated as waves of change of this space-time curvature. The “gravitational radiation” must be reformulated to be just the lower part of the EM radiation spectrum near zero frequency, again not involving any physical space-time curvature. A curvature is observable when a statistically large number of particles, expressed via mass, interact with the gravity field. When a particle’s interaction with the gravity field is expressed in a way that does not involve mass, only via particle’s spatial probability density function like in the case of photon, interactions with the field become linear in time and space (“dx” will be constant all the time in fig.6 while dE affects photon’s frequency). Due to this the time scale change (see $Z=m^{-1}s^{-2}$ above) on the microscopic (particle) scale may be much less apparent than on the macroscopic scale. The effects of the statistical time scale change are probably best studied involving macroscopic biological entities.

This paper strongly suggests that a photon cannot be deflected by a gravity field due to photon’s lack of mass and inertia, only the frequency of photon may change in a gravity field.

The known equation between photon's "momentum" and its energy E=|p|c stays in a physically uncertain relation to the equation E=hv: when photon's measured frequency changes, two explanations are possible: photon was deflected and simultaneously changed its frequency, or photon was not deflected, but changed its frequency. This poses an unresolvable problem which leads to mostly random operations over physical measurement data. E=|p|c is unlikely to be a usable equation, at least in the terms of this theory, because "p" is momentum, a SI unit kg*m/s, which must be non-applicable to massless particles. Any situation when a deflection of photons by gravity field is hypothesized should be checked against a possibility of "gaseous matter"-based deflection which may also change photon's frequency due to Doppler shifts. The lensing and deflection effects can also appear when a "gaseous matter" is affected by a strong gravity field, yet the photon radiation of this matter is not lensed nor deflected.

The absence of non-jet radiation in a black-hole can be due to redshift so strong that photon's frequency decreases down to zero and photon literally "dissolves". This possibility poses a hypothesis that photon's energy relation to frequency E=hv may be non-linear near zero frequencies, or otherwise the redshift may yield a negative photon's energy.

IX

It can be hypothesized that in order to detect gravity field changes it is necessary to precisely measure ambient EM energy spectrum around zero frequency, which requires electromagnetic equipment of a high precision. Photon's red- and blueshift can be also used as a measure of the gravity field and its gradient (the direction of frequency shift depends on photon's direction vector relative to the gravity field). Any particle interactions that lead to an increased ambient energy spectrum around zero frequency can be hypothesized to be interacting with or via gravitons.

It can be hypothesized that for precise modeling of body motions at low kinetic energies it may be necessary to find the absolute kinetic energy of a particle or body, free of any frames of reference, by measuring average arrival time and angle of billions of short-time visible light photon pulses in the current frame of reference. The summary gravity field can be additionally measured by evaluating the average change of frequency of these pulses. This will require 3 fast-acting photon detectors placed in equiangular triangle formation in front of a photon emitter at a known distance along the normal vector to this formation, plus 1 more detector in the center of this formation, tuned to a slightly different resonant frequency than the other 3 in order to detect photon frequency change (fig. 10). The plane area (weighted geometric cross section area) of photon should be known to calculate the gravity field's energy per cubic meter from photon's frequency change and distance. It is a hypothesis of this paper to assume that such plane area can be found if photon's energy can be expressed via the "energy density function" which bounds spatial position of photon (photon's spectral line which is infinitely thin is spectrally convolved by the spatial probability density function yielding a "thicker" spectral line). Additionally, such measurement system can be rotated along its axes to increase precision and measure gravity field's gradient vector, and also to reduce systematic measurement errors. Eventually, such systems can be embedded into hand-held devices together with accelerometers and magnetometers.

X

The following 1-dimensional graviton simulation program in C programming language demonstrates that the energy in the "body-graviton" system is conserved, supporting a hypothesis that such system follows the "principle of least action", essential for physical systems.

This simulation uses the Adams–Bashforth three-step explicit method of integration, which is strongly stable. Simulation is run for 300 seconds.

```
#include <stdio.h>
#include <math.h>
const double M_PI = 3.14159265358979324;

double fed( const double x, const double DE, const double sigma )
{
	// Energy density function (2). DE - graviton's energy delta.
	const double sigmasq2 = 2.0 * sigma * sigma;
	return( DE * exp( -( x * x ) / sigmasq2 ) / sqrt( M_PI * sigmasq2 ));
}

double vel( const double E, const double mass )
{
	// Non-relativistic velocity of a body with kinetic energy E and mass.
	return( sqrt( 2.0 * fabs( E ) / mass ) * ( E >= 0 ? 1.0 : -1.0 ));
}

int main()
{
	const double h = 0.02; // Integration step, s
	double t = 0.0; // Initial time, s
	double x = -2.0; // Initial body's position, m
	double E = 0.003; // Initial body's energy, J
	const double mass = 10.0; // Body's mass, kg
	const double sigma = 0.5; // Graviton's sigma. Center is at x=0
	double DE = -0.004; // Graviton's delta energy, J. Graviton's velocity equals 0.

	double v = vel( E, mass );
	double dE = fed( x, DE, sigma ) * fabs( v );
	double dx = v;
	double p2dE = 0.0;
	double p2dx = 0.0;
	double p1dE = 11.0 * dE / 12.0;
	double p1dx = 11.0 * dx / 12.0;

	while( t < 300.0 )
	{
		v = vel( E, mass ); // m/s
		printf( "%f\n", E );

		dE = fed( x, DE, sigma ) * fabs( v ); // J/m * m/s
		dx = v; // m/s
		E += h * ( 23.0 * dE - 16.0 * p1dE + 5.0 * p2dE ) / 12.0;
		x += h * ( 23.0 * dx - 16.0 * p1dx + 5.0 * p2dx ) / 12.0;
		t += h;
		p2dE = p1dE; p1dE = dE;
		p2dx = p1dx; p1dx = dx;
	}
}
```

Figure 6: 1-D "body-graviton" interaction simulation program in C programming language.

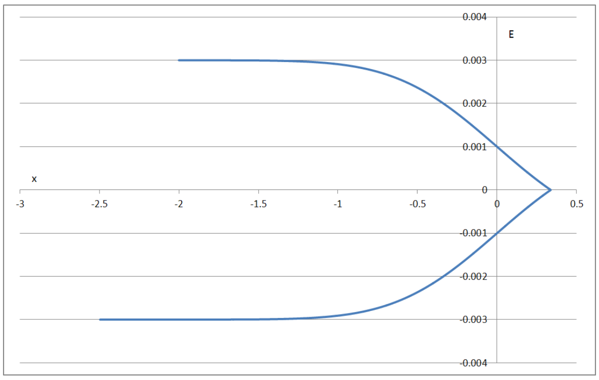

Figure 7: Integration of body's energy (E) and position (x) in the vicinity of graviton (x=0), see fig.6. The energy of graviton is not absorbed, because its change is higher (-0.004 J) than body's initial energy (0.003 J). The body "bounces back" and changes the sign of its velocity vector (represented as negative energy).

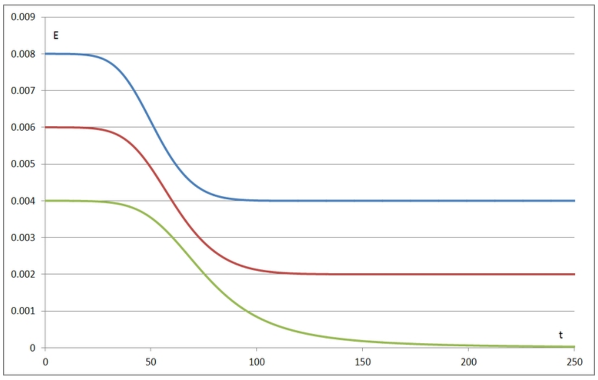

Figure 8: Integration of body's energy (E) over time (t) at various initial body energy settings (0.004 J, 0.006 J, 0.008 J), in the vicinity of graviton, see fig.6.

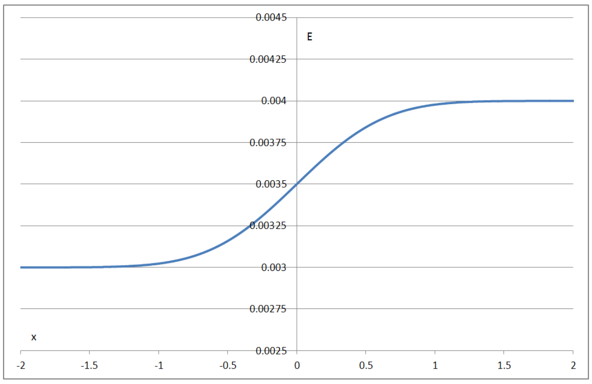

Figure 9: Integration of body's energy (E) and position (x) in the vicinity of graviton (x=0), with graviton's delta energy set to a positive value (0.001 J), see fig.6.

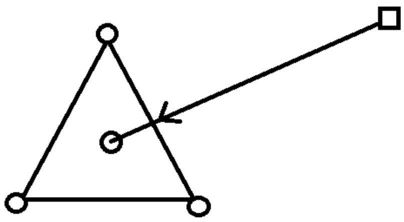

Figure 10: Scheme of absolute kinetic energy and gravity field's energy density detector. Circles are photon detectors, rectangle is a photon emitter. Line with an arrow on it – the normal vector and the direction of photon pulse emitting.