What is the energy - Two laws of motion c.s. fields

What is the energy

Recently I worked with .ato files which help to understand what energy is, how is created and how moves in matter etc. For simplify, I created new version of the program, based on Self-Acceleration.exe. I called him Self-Ac_M1.0256.exe and I created this program for that the radius of potential shell or anti-shell was exactly equal to the distance from the central point of the field to the place where there is extreme potential values of shell. In the program source code the number of 1029 has been replaced by the number of 1.0256.

These adaptation of the program makes it easy to observe and calculate the relationship between various parameters that are modelled by the program. For example, the vibration frequency f1 of the test particle on the shell with radius R and vibration frequency f2 of that particle on the shell with radius n*R satisfies the equation f1/f2 = n. It stands to reason that the particle vibrates every time at the same initial parameters, which relate to it's location on the potential shell. So when in one exercise the start position of the test particle is set to X=0.9*R, then in the second exercise the initial position of that particle is in the position X=0.9*n*R. For this reason, the size of the amplitude of these vibrations describes the equation Ams2/Ams1=n and the frequency ratio f1/f2=n.

Modeling program "Self-Ac_M1.0256.exe" can be copied from: http://pinopapliki2.republika.pl/Self-Ac_M1.0256.zip. Program includes the working file with .ato format. There are the output files (eg. Czes_drgan1.ato) and files which store the parameters of particles after making some calculations by computer (eg. Czes_drgan1_504.ato and Czes_drgan1_505). Number of iterations are used as a measure of time. In the example (in parenthesis) was measured the time of ten "full" vibrations made by the test particle (with mass A2=0) placed on the potential shell of the neighbour particle (with mass A1=100).

Files Czes_drgan1.ato, Czes_drgan1a.ato and Czes_drgan1b.ato differ in that after running process from the first file it can be observed a vibration of the test particle on the potential shell of neighbour particle with mass A1=100. However, after you run the processes on the basis of the following two files, both particles vibrate, either in the field (on the shell) of his neighbour. But the masses of particles in these processes are A1=50, A2=50, and A1=70, A2=30.

On the basis of the exercise with interacting particles can draw conclusions about what energy is, how it creates in matter and spreads. Because, for example, the results of presented exercises with modelled particles shows that when we have two particles, which fields are described by the same mathematical function, if their total mass is constance, the pair of these particles due to interaction (at the same initial conditions on the relative positions and zero initial speed) vibrate with the same frequency. In contrast, the relationship between the mass of particles decide what speed they have, when move according to Newton's laws.

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Poland, Legnica, 24.10.2014.

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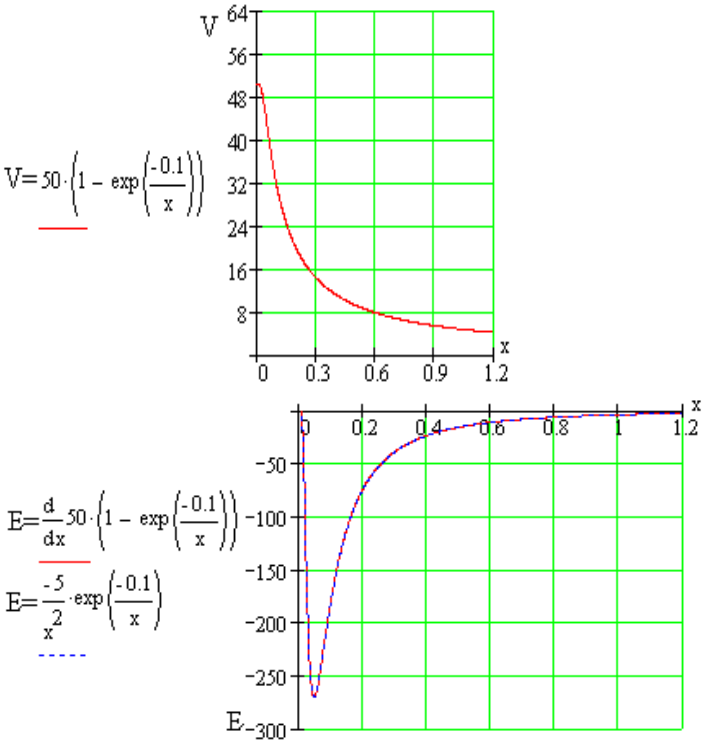
The essence of energy can be known based on the exercise with models of fundamental particles of matter. These types of particles, and more specifically, the interaction between them is described by mathematical functions. On the basis of these mathematical functions work the modelling computer programs: Self-Ac_M1.0256.exe (http://pinopapliki2.republika.pl/Self-Ac_M1.0256.zip) and Gas2nA.exe (http://pinopapliki2.republika.pl/Gas2n_A_exe.zip). For this reason, that the mathematical function that describes the change in the potential field of fundamental particles of matter comprises two components: - a gravity component and structural component - it is convenient to observe the interaction of the particle with the first or the second component of potential function. Convenient - to be understood in the sense that in this case the function components do not overlap on each other and it is clearly visible the separate effects of each of these two components of the fundamental impact.

The gravitational component of potential are described by using the exponential function (E) - an example of which is shown below using formulas and diagrams regarding the potential and intensity of field.



And in such a way interact the centrally symmetric fields - particles in program Gas2nA.exe. Just keep in mind that during exercise with the gas. format files that interact according to the E function, on the board “Formula” must be active the “E” button and removed the "lock XYZ particles from position 1-:-4" (of course, this applies to situations where the particles from these positions (lines of Listing board) are to have freedom of movement).

During exercise with two particles interacting with each other can be said the manifestation of the physical law, which may be called - **the law of equal vibration frequency.** This law can be formulated as follows:
Two particles - centrally symmetric fields - with a total mass m, regardless of the proportion of their own masses m1 / m2, where m1 + m2 = m, with the same initial parameters of the interaction process, vibrate relative to each other with the same frequency. In other words, the speed of these two particles relative to one another change with time in the same way. If select a particular moment with the oscillating process, for example, the moment of the highest particle velocity relative to each other or the same number of iterations from the start of process with the same initial parameters, irrespective of their mass ratio, the relative velocity of particles is the same.

The example data from exercise were recorded in the working .gas files and they are shown below (the files are located on the http://pinopapliki2.republika.pl/Cwicz_dwa_prawa.zip)
In these files the particle velocity are shown after 10 310 iterations made by a computer, from which results the total particle velocity with respect to each other - this is approximately the maximum particle velocity relative to each other:

Program Gas2n_A.exe (Funkcja E)
Predkosci_0-100_10310.gas
ΔX(1;31)=>0,00235064875190059
ΔV=V(1)=>-13,7929650514067

Predkosci_25-75_10310.gas
ΔX(1;31)=>0,0023506487519
V(1)=>-10.344723788555
V(31)=>3.44824126285167

Predkosci_50-50_10310.gas
ΔX(1;31)=>0,0023506487519
V(1)=>6.89648252570334
V(31)=>-6.89648252570334

10.344723788555 + 3.44824126285167 = 13.7929650514067

6.89648252570334 + 6.89648252570334 = 13.7929650514067

In the following work files there is registered an approximate duration time of one period of vibration of particles relative to each other.

Program Gas2n_A.exe (Funkcja E)
Predkosci_0-100.gas
Predkosci_0-100_41235.gas
Predkosci_0-100_41236.gas

Predkosci_25-75.gas
Predkosci_25-75_41235.gas
Predkosci_25-75_41236.gas

Predkosci_50-50.gas
Predkosci_50-50_41235.gas
Predkosci_50-50_41236.gas

The law of equal vibration frequency of the two particles (c.s. fields) relative to each other is related to **the law of equal angular velocity of the orbital motion**. These laws are interrelated in the sense that they are derived from the same interacting causes, that is from the same function of interaction. **The law of equal angular velocity of the orbital motion** can be formulated as follows:
Two particles - a centrally symmetric fields - with a total mass m, regardless of the proportion of their own masses m1/m2, which occur in a variety of situations, where m1 +m2=m, with the same initial parameters of the interaction process when circulating on orbit around a common center of mass, the angular velocity of the orbital motion in these different situations is the same.
This law formulated in that way is associated with the case where the particles move along circular orbits. But the particles can move around the elliptical orbits or similar to the elliptical. Then the angular velocity of the orbital motion in any such situation changes, but these changes in different (listed here) cases proceed in the same way.
Below are shown the working .gas files, based on which the operation of law of equal angular velocity orbital motion was checked.

Predkosci_0-100_E_wir.gas
Predkosci_0-100_E_wir28791.gas

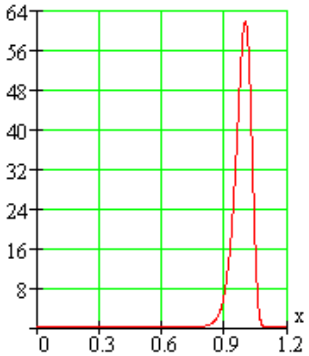
Predkosci_25-75_E_wir.gas
Predkosci_25-75_E_wir28791.gas

Predkosci_50-50_E_wir.gas
Predkosci_50-50_E_wir28791.gas

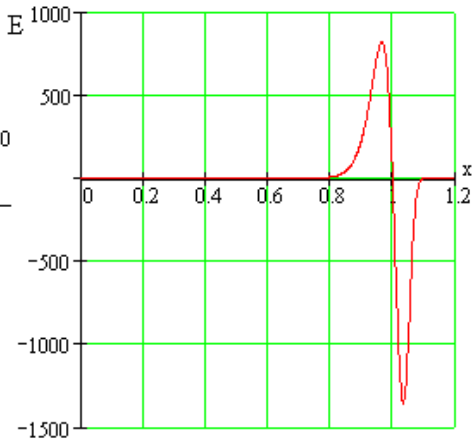
In a similar way, i.e. in accordance with mentioned here two laws of physics, two particles behave relative to each other when are located on the potential shell of it's neighbor, when moving in accordance with the function of PES.
A single shell is only a part of the fundamental structural component of field. An example change of potential and the field strength on the potential shell, which is described by the PES function, show the following formulas and charts.

$$\frac{2.5 - \left(\frac{1.0256 \cdot x}{1}\right)^{20}}{0.1 \cdot \frac{1.0256 \cdot x}{1}}$$

$$50 \cdot \left(\frac{1.0256 \cdot x}{1}\right)$$



$$E = \frac{d}{dx} 50 \cdot \left(\frac{1.0256 \cdot x}{1} \right) \qquad \frac{2.5 - \left(\frac{1.0256 \cdot x}{1} \right)^{20}}{0.1 \cdot \frac{1.0256 \cdot x}{1}}$$



A similar behavior of particles when they interact with each other as a function of PES, particularly relates to conduct pair particles in accordance with the law of equal vibration frequencies. Because the behavior according to the law of equal angular velocity of the orbital motion is more difficult to test using computer exercises. Because you have to choose the initial velocity of the particles in the orbital motion, to each of the two particles vibrate as less as possible and thus as a result this orbital motion remained somewhat pressed against the outer edge of the shell.
If you can afford to be patient matching the trial and error of initial particle parameters, using a computer exercise to obtain confirmation of particle behavior in accordance with the law of equal angular velocity of orbital motion, it's just for your own pleasure and satisfaction with a positive result. Because this type of computer exercises only indicate the existence of these two laws of physics - they are some kind of digital evidence of their existence. **The mathematical proof of the existence of these two laws of physics waiting to be discovered.**
What kind of want proof? Mathematicians know that there is only "three-body problem". To analyze the motion of two bodies, when you know in which direction it should take place in mathematical analysis should not be a problem. Thus, it can be expected that such a mathematical proof of the existence of these two laws of physics may soon arise.
In conclusion, here are some .ato format files, and some of the results obtained during the exercise.

Program Self-AC_M1.0256.exe (Funkcja PES)
Cz_drgan1_100-0.ato
Cz_drgan1_100-0_504.ato
Cz_drgan1_100-0_505.ato
Cz_drgan1_100-0_17128.ato

Cz_drgan1_70-30.ato
Cz_drgan1_70-30_504.ato
Cz_drgan1_70-30_505.ato
Cz_drgan1_70-30_17128.ato

Cz_drgan1_50-50.ato
Cz_drgan1_50-50_504.ato
Cz_drgan1_50-50_505.ato
Cz_drgan1_50-50_17128.ato

Program Self-AC_M1.0256.exe (Funkcja PES)
Cz_drgan1_100-0_17128.ato
ΔX(1;51)=>1,00065090966756
ΔV=V(51)=>14,793129731021

Cz_drgan1_70-30_17128.ato
ΔX(1;51)=>1,00065090966756
V(1)=>-4,43793891930631
V(51)=>10,3551908117147

Cz_drgan1_50-50_17128.ato
ΔX(1;51)=>1,00065090966756
V(1)=>-7,39656486551051
V(51)=>7,39656486551051

4.43793891930631 + 10.3551908117147 = 14.793129731021

7.39656486551051 + 7.39656486551051 = 14.793129731021

The vibration of two particles - the distance between particles at maximum relative velocity 1.00065090966756 l. u. (length units)

Cz_drgan1_100-0_17128.ato; A1=100 A2=0

14.793129731021·1 = 14.793129731021 j.pr.

Cz_drgan1_50-50_17128.ato; A1=50 A2=50

7.39656486551051·2 = 14.793129731021 j.pr.

Cz_drgan1_70-30_17128.ato; A1=70 A2=30

10.3551908117147 + 4.43793891930631 = 14.793129731021 j.pr.

Data were obtained in collaboration with the modelling program Self-Ac_M1.0256.exe

At the end of this cycle of computer exercises, as well as for the opening of a new series of exercises below are presented .ato working files, and through them is given a list of changes of the natural frequency of particles, which occur when changing the shell. The point is here about change the shell, by which bind together of the two particles - two c.s. fields, on the other shell of different radius, thereby resulting in binding of different length and different durability.

Program Self-AC_M1.0256.exe (Funkcja PES)
Czas_10drgan1_100-0.ato
Czas_10drgan1_100-0_504.ato
Czas_10drgan1_100-0_505.ato

Czas_10drgan5_100-0.ato
Czas_10drgan5_100-0_2520.ato
Czas_10drgan5_100-0_2521.ato

Czas_10drgan10_100-0.ato
Czas_10drgan10_100-0_5041.ato
Czas_10drgan10_100-0_5042.ato

It is known that the binding of protons and neutrons occurs at very small distances. Evidenced by the very small dimensions of the nucleus relative to atomic dimensions. If for the description of bonds used the term of potential shells, it is possible to distinguish nuclear shell system (which occur due to the formation of nuclear binding) and a system of molecular shell, whereby molecules are formed. And this new series of computer exercises can be used to study the size and length of the shell radii and molecular bonds.

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