

THE COLD FUSION AS A SPACE-TIME ENERGY PUMPING PROCESS

ATHANASSIOS A. NASSIKAS

Technological Edu. Institute of Larissa.
10, Ethnikis Antistasseos Str. 41 335 Larissa Greece.
E-mail: a.a.nass@teilar.gr

Abstract

The purpose of this paper is to explain the cold fusion phenomena as a space-time energy pumping process on the basis of the hypothesis of the Quantum Space-Time; this hypothesis is based on *the unification of the physical meaning of the notions which derive either from the GRT or the QM*. An experiment is proposed to verify this cold fusion explanation.

1 Introduction

According to the GRT, a particle field consists of a particle matter and a spacetime continuum which surrounds this matter. According to the QM, a particle field is described by means of a matter (De Broglie) wave, which includes the notion of a particle matter. If we want to *unify the physical meaning of the notions which derive either from the GRT or the QM*, the following principles should be valid : *Principle I. "Any infinitesimal spacetime can be regarded as a matter wave". Principle II. "The energy of any oscillating infinitesimal spacetime is equivalent to its internal time"* ; where as internal time is defined a time τ of a phenomenon of comparison. The hypothesis of the Quantum Space-Time(QST) [1,2] is based on these principles and implies that space-time is stochastic and it can be regarded as matter -ether. However, matter can be either mass or charge. Thus, there exist both mass-gravitational (g) and charge-electromagnetic (em) spacetime. The (em) spacetime behaves as a (g) spacetime , since both are spacetime and obey the same principles I,II, but it is not. Thus, any time interval in the (em) spacetime is incomprehensible with respect to a coexisting (g) spacetime and it can be regarded as an imaginary number which is incomprehensible too. *According to principle II the energy of an infinitesimal (em) spacetime can be regarded as imaginary since it is equivalent to an (em) time interval. Therefore, in general, the electromagnetic energy can be regarded as imaginary.* A gravitational spacetime energy E_g can be converted into an electromagnetic spacetime energy E_{em} by means of photons and vice versa. Thus, in a closed system , the conservation principle can be applied as follows:

$$\bar{E}_g + \bar{E}_{em-g} = \text{constant} \quad (1)$$

where the em-g index indicates a gravitational space energy in such a way that $\bar{E}_{em} = i\bar{E}_{em-g}$ and the dash ($\bar{\quad}$) indicates the mean value. It is stressed that the energy of a system is a stochastic quantity, thus the mean value is meaningful . If we consider the Universe as a closed system which has been derived from zero, then the following equation applies:

$$\bar{E}_g^U + \bar{E}_{em-g}^U = 0 \quad (2)$$

where the superscript ^U indicates Universe quantities. In a particle field, the following equation is valid according to the QST hypothesis:

$$\langle E \rangle \langle V \rangle = hc \quad (3)$$

i.e., the product of the energy expectation value of a particle field multiplied by the expectation value of the volume which contains that energy, is equal to hc . In general, it can be proved that the volume \bar{V}_g increase of a closed system has as a result the energy \bar{E}_g decrease and vice versa. Thus, when \bar{E}_g^U is very high, the volume \bar{V}_g^U that contains \bar{E}_g^U will be very low. Universe's expansion means increase of \bar{V}_g^U and decrease of \bar{E}_g^U as well as increase of \bar{E}_{em-g}^U according to the equation (2). From the equation (2) it is derived that for positive value of \bar{E}_g^U the \bar{E}_{em-g}^U value will be negative. Thus, the Universe evolution is a process reverse to that of the Universe creation, and during this evolution the quantity \bar{E}_g^U decreases tending to zero, while the quantity \bar{E}_{em-g}^U increases tending also to zero. We can assume that the charge energy \bar{E}_{em-g}^U is the charge energy sum of all the proton-electron couples regardless of whether they are joined or not. This means that the absolute value of the proton charge, assumed as negative energy, is greater than the electron charge – assumed as positive energy -, so that the total \bar{E}_{em-g}^U will be negative. According to existing measurements, the proton charge is $4,803206815 \times 10^{-10}$ esu [3]. According to the existing data, the electron charge is $e = \sqrt{\alpha \hbar c} = 4,80319626 \cdot 10^{-10}$ esu [3]. When there is a tendency for increase and nullification of \bar{E}_{em-g}^U , this means that there is an approach and coincidence tendency between the positive and negative charges of the proton-electron couples. The electron charge, if considered as an imaginary mass, is not constant but it varies with its velocity; thus, when the electron approaches the proton, it will have a value able to neutralize it. Thus, the approach between electrons and protons has as a result the increase of \bar{E}_{em-g}^U and due to equation (2), the decrease of \bar{E}_g^U . Consequently, we can assume that *during the approach between $e^- + P$, a gravitational space energy absorption takes place* . This might be compatible with the reaction [4]:



which is endothermic. According to N. Kozyrev 's observations, the stars on which no nuclear reaction take place, are radiant and this radiation is proportional to the electrons

density at the radiating area [5,6]. This shows a relation between the radiation and the electron-proton couples mentioned.

2 Space-Time Energy Pump

We denote by E the energy level of an electron, excluding its rest energy, in a radius r in the hydrogen atom and by E_{el} the kinetic energy that the electron acquires during the free fall from radius $r = \infty$ to radius $r = r$. According to the QST hypothesis, matter is the spacetime itself and the energy E_{el} is the energy-matter of the space within which this energy exists. According to Classical Mechanics, the transfer from one energy level E_{el} to a higher one takes place through action of the proton field on the electron. *According to the QST hypothesis, there is no action from a far distance and the energy increase is caused only by matter increase.* Therefore, during the transfer from one level of energy E_{el1} to a higher level of energy E_{el2} which corresponds to a smaller radius r , we should have, according to the QST hypothesis, absorption of energy-matter by something that exists out of the space which encloses energy E_{el1} . Since the increase of E_{el} has as a consequence the decrease of the radius r , this means that this increase corresponds to $e^- + P$ approach. According to what was mentioned above, the $e^- + P$ approach has as a consequence the absorption of (g) space energy-matter δE_g ; this energy according to the QST hypothesis, causes the increase of the level of energy E_{el} . By definition, it is valid that $E = -E_{el}$; therefore the transposition from E_{el1} to E_{el2} is equivalent to the transposition from the energy level $E_1 = -E_{el1}$ to the energy level $E_2 = -E_{el2}$. If E_1 and E_2 correspond to fundamental energy levels of the electron in the hydrogen atom, then, *as it is experimentally verified, photon emission will take place. Because of the $e^- + P$ approach, as was above mentioned, gravitational energy δE_g absorption will occur.* Applying the energy conservation principle, we have as a result the following equations:

$$\begin{aligned} E_{el0} + E_{el1} + \delta E_g &= E_{el0} + E_{el2} + h\nu, \\ \delta E_g &= E_{el2} - E_{el1} + h\nu = (E_1 - E_2) + (E_1 - E_2) = 2(E_1 - E_2) = 2(E_{el2} - E_{el1}) \end{aligned} \quad (5)$$

Where E_{el0} is the total electron rest energy related both to mass and charge which charge is regarded as an imaginary mass. Thus, during the approach between $e^- + P$ a gravitational space energy absorption δE_g takes place that fulfills eqn (5). This energy δE_g is converted partly into photons ($h\nu = E_{el2} - E_{el1} = \delta E_g / 2$) and partly to energy increase in order to reach the energy E_{el2} ($E_{el2} = E_{el1} + \delta E_g / 2 = E_{el1} + E_{el2} - E_{el1}$). According to this analysis the energy E_{el} takes in addition into account the energy δE_g ; this is understood taking into consideration the relativistic changes of mass and load which is regarded as an imaginary mass. Taking into account the above mentioned, we conclude that the electron when approaching the proton increases in charge until it is valid that: $Q_{proton} = -Q_{electron}$ or $Q_{proton} + Q_{electron} = 0$, a fact that corresponds to charge disappearance and -according to eqn(4)- to neutron and neutrino production.

After the 1st fundamental energy level of an electron in the hydrogen atom there is no permitted state other than the one corresponding to the elimination of the couple $e^- + P$ and

to the neutron generation. Thus, any other state can be regarded as unstable. When reaching an unstable state E_2 lower than the fundamental E_1 in order that gravitational space absorption and photon emission are possible, the conditions of the equations (5) must be fulfilled. Consequently, it is valid: $E_1 - E_2 = h\nu$. Let's assume that a negative potential is imposed on the hydrogen atom. Due to the negative potential, no other permitted level interferes between the level $E_1 = -13,6 eV$ and the level $E_\infty = 0$ and consequently the energy rejection must take place by photons of energy $-E_1$. Thus, it will be valid that:

$$E_1 - E_2 = -E_1 \quad \text{and} \quad E_2 = 2E_1 \quad (6)$$

Equation (6) can be extended to energy levels so that:

$$E_{k+1} = (k+1)E_1 \quad (7)$$

given that there is a difference $E_1 - E_{k+1} = -kE_1$, that is an integer multiple of $-E_1$ and consequently it can be rejected in the form of quanta with energy $-E_1$. Reaching the state E_{k+1} , a gravitational space absorption takes place according to eqn (5) so that we will have:

$$\delta E_{g_{k+1}} = 2(E_1 - E_{k+1}) \quad (8)$$

Because of the equations (7,8) it is valid:

$$\delta E_{g_{k+1}} = kx27,2 eV \quad (9)$$

Equation (9) is similar to Mills' equation for the rejected energy during the conversion of hydrogen's atom into a stable state-hydrino[7]. Nevertheless, the levels E_{k+1} are unstable and different from those given by Mills. It is noted that eqn (9) has been derived from eqn (5) as if the states E_{k+1} were stable; however we cannot exclude graviton emission when electron moves from E_{k+1} to E_1 . Thus, we could regard this phenomenon as stochastic; the possibility for photon emission is reinforced by the Kozyrev star radiation which takes place under constant matter structure (without nuclear reactions)[6].

On the basis of the aforementioned analysis, we can compose a space-time energy pump which can convert the ether's space-time energy into thermal energy or into mechanical or electrical work, by means of a system that displaces the electron of the E_1 fundamental level of the hydrogen atom to an unstable energy level E_{k+1} and returns it to the state E_1 . In such a system gravitational space energy absorption $\delta E_{g_{k+1}}$ will take place and its conversion into photons with simultaneous return of the electron to the stable situation E_1 under the condition that the aforementioned system imposes the energy level E_1 as the unique stable situation permitted.

3 Interpretation of the Cold Fusion Phenomena

During the heavy water electrolysis, heavy hydrogen is formed on the cathode and oxygen on the anode. When palladium is used as a cathode, the heavy hydrogen is absorbed inside the palladium. Because of the negative cathode potential, the heavy hydrogen electron is

on the 1st level and a force is exerted on it, pushing it towards the nucleus. Thus, an approach between $e^- + P$ will take place by means of unstable states, in the same way as it has already been mentioned in Sec. 2. These unstable levels are probable to exist while the energy eigenvalue remains at the permitted energy level E_1 . In this way, a space-time energy pump will be formed, having as a result the gravitational space energy pumping and the production of photons that heat the whole electrolytic system. The above mentioned are also effective in the case of light water electrolysis given that exactly the same mechanisms are being activated in the cases of both the heavy and the normal hydrogen. Thus, Mills' experiments [7] can be explained on the basis of the space-time energy pump; *this is an alternative explanation since hydrinos have not been detected*. The aforementioned concern an excess heat generated without any reaction. However, during the cold fusion phenomena there is detection of nuclear reaction products. All these can be explained on the basis of the following reactions[4]:



The energy of 0,783 MeV, according to Conte approved by Mizuno explanation [4], is covered by the electron capability to have – according to quantum mechanics – a presence probability under high energy as well as by the developing of an excess potential in very small distances between electron and proton. However, the energy of 783000 eV is difficult to be handled by means of low voltages. Thus, it is expected that the reactions (10,11) are significantly facilitated by the gravitational space energy absorption during the approach between $e^- + P$, which is not rejected but it is used for the creation of the next stable state (n + neutrino).

4 A Proposed Experiment

For the purposes of this chapter the following definitions are useful:

As reference spacetime is defined a Euclidean spacetime to which, through transformations of deformity, any field can correspond. Any magnitude of it will be denoted by the subscript $_0$. *As Hypothetical Measuring Field (HMF)* is defined a hypothetical field, which consists of the reference spacetime, in which at every point A_0 the real characteristics of the corresponding point A of the real field exist. In a HMF it is defined as *relative time* the ratio $tr = dt / dt_0$, where dt is an infinitesimal time of comparison.

According to the QST hypothesis we have that the gravitational acceleration $\bar{g}(r,t)$ at a point (r,t) of the HMF is [1,2,8]:

$$\bar{g}(r,t) = \frac{c^2}{P(r,t)} \nabla P(r,t) = \frac{c^2}{tr(r,t)} \nabla \bar{tr}(r,t) \quad (12)$$

where $P(r,t)$ is the probability density of a matter system considered as a whole and $\bar{tr}(r,t)$ is the mean value, due to uncertainty, of relative time which correspond to (r,t) of the HMF; $\bar{tr}(r,t)$ is proportional to the HMF ether density at the point (r,t) [1]. Because of eqn (12), what is shown in Fig.1a will take place, that is the attraction on an object is attributed to the fact that the space time-ether under the object attracts the object more

than the upper one and that $\bar{tr}_2 > \bar{tr}_1$ [1,2,8]. If we reduce the ether energy density under the body [1,7], i.e. if we succeed in having $\bar{tr}'_2 < \bar{tr}_2$ then a weight loss of the object will take place as it is shown in Fig.1b

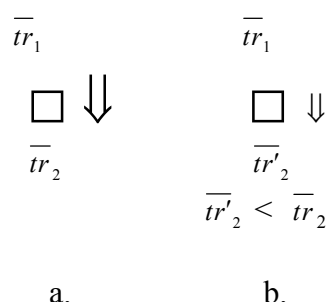


Fig.1

Fig.2

Fig.3

These can take place through the arrangement of fig.2 [9]. The nickel plate 1 is hydrogenated at its lower part 2. The already hydrogenated area 2 is covered by a layer of nickel plating 3. Through the insulating bars 4 the whole system lies on scales 5. Through a production and regulation electric pulses system 6 negative voltage electric pulses of the form of fig. 3 are exercised on the parts 1 and 3. According to what was mentioned in Sec. 2,3 ether absorption will take place in the area 2. Ether will reach the area 2 through the less attracting area of nickel plating 3. Thus it is expected that what is shown in fig.1 will take place. A detectable weight loss is expected, through the scales 5, since the ether energy absorption is at the level of the excess heat, similar to Mills' one, at area 2.

REFERENCES

- [1] Nassikas, A.A., 1999. The Hypothesis of the Quantum Space Time - Aether. Accepted for publ. in Galilean Electrodynamics, Special Issues 2, 2000. Available at www.physical-congress.spb.ru
- [2] Nassikas, A.A., 1997. The Hypothesis and the Equations of the Unified Matter Field. Infinite Energy - Cold Fusion Technology, Inc. Vol.3, No.13&No.14. Available at www.physical-congress.spb.ru
- [3] Gervolin, I.L., 1991. To Live Without Disasters. Higher Naval Engineering College. St. Petersburg.
- [4] Mizuno, T., 1998. Nuclear Transmutation: The Reality of Cold Fusion. Infinite Energy Press. Concord, NH.
- [5] Frolov, A., 1998. The Source of Excess Energy. Infinite Energy, Vol.(4) Issue 20.
- [6] Dadaev, AN., 2000. Astrophysics and Causal Mechanics. Galilean Electrodynamics, Special Issues 2, 2000.
- [7] Mills, R.L., 1991. Energy/matter Conversion Methods and Structures. International Patent Publication Number WO 92/10838. Infinite Energy, Vol.(3) Issue 17.
- [8] Nassikas, A.A., 1994. The Hypothesis of the Unified Field and the Principle of its Dual Interpretation. III International Conference: "Problems of Space, Time, Gravitation". Russian Academy of Sciences. St. Petersburg, Russia. Available at www.physical-congress.spb.ru
- [9] Nassikas, A.A., 1999. Space Time Energy Pump. Patent application No 990100439, Greek Organization of Industrial Property.