Catalytic Oxidation-like Nuclear Nano-Fusion; Fractal Involving of Room Temperature Magnetically Induced μ-Catalyzed Fusion

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Abstract

The nuclear fusion reaction can be catalyzed in a suitable fusion fuel by muons (heavy electrons)."For the fractal relations, ranging from DNA knots to solar neutrino flux signals", ever derived of scale- invariant properties distinguished between classical invariant theory & quantum invariant theory subfactors. Accompanying isomorphicity & Connes FusionTensor Product retrieved to μ-catalyzed fusion where surroundings of room temperature fusion driven by the balance in mtDNA fusion & fission. On behalf of nanometer dimension of radius of heavy electron & wavelength of UV-light,it assumed that muons can be produced by oxidation-like decay when UV-light impinging water, indicated by a magnetic field induced perhaps by a ring South-North poled element.

Keywords: Catalytic Nano-Fusion, Connes Fusion Tensor Product, Mtdna, Bio-Nanohybrid

Introduction

The nuclear fusion reaction can be catalyzed in a suitable fusion fuel by muons (heavy electrons), which can temporarily form very tightly bound mu-molecules [1]. Muons can be produced by the decay of negative pions, which, in turn, have been produced by an accelerated beam of light ions impinging on a target. Muon-catalyzed fusion is appropriately called "cold fusion" because the nuclear fusion also occurs at room temperature.

Ever derived of similar Hamiltonian concerned in Random Field Ising Model/RFIM in external field, for Connes Fusion Tensor Product and Photon Gluon Fusion sought "dynamic behavior driven by the balance in mitochondrial fusion & fission [Carveney, 2007] whereas between fusion and superconductors laid "electricity" as well as comprising photo/magnetochemistry [2]. Accompanies "the energy thus produced is enormous, and because deuterium is very cheap in the form of heavy water (less than US $ 1/gm), the fuel cost for this process is very low indeed (less than 1 cent per KwH)"[3].

Between CFTP & PGF

In plasma physics, plasmas which are ionized gas must meet three conditions for fusion to occur, including reaching sufficient temperature, density and time- that is Lawson criterion and the fusion reaction such as $1H_1 + 1H_1 \rightarrow H_2$ is algebraic.

As found in von Neumann algebra in infinite-dimensional Hilbert space, distinguished between classical invariant theory &quantum invariant theory subfactor described the subfactor theory & Witt-algebra, explained about Connes Fusion Tensor Product/CFTP related the Connes fusion as corresponded to composition of homomorphism[4,5]:
- classical tensor product O-X adds the changes
- Relative tensor product H-X preserve the changes, followed by natural isomorphism.

For Photon Gluon Fusion/PGF defined:"photon is the gauge boson of quantum electrodynamics/QED, the simplest of all boson" .

Quotes "the isomorphicity of these module spaces for general G " also defined Conformal Field Theory are "quantum field theory which are invariant under conformal transformation & in 2D there are infinite dimensional algebra. Alain Connes states theirselves the Connes fusion as "associative tensor operation" to be in coincidences.

There is hypothesized whereas occur any similar evidence between fusion in tensor product and nuclear reaction in hydrogen isotope whereas "classical invariant theory" represented in heavy-water fusion cell and "quantum invariant theory" depicted in organic photodetector chip quoted from Clark & Lanzani comprising similar light-path through magnifying glass and Focusing lens [6].

Multifractals in Hamiltonian similarity

Fractal evidence at least occurs in exciton fusion kinetics in isotopic mixed crystals modeled by Monte Carlo random walks on random binary lattice [7].
In "Fields, Fractals & Flares..', 2009, Paul A. Conlon depict fractal relation, ranging from DNA knots to solar neutrino flux signals. Especially to mtDNA who comprise fusion &fission

mechanism, "fractal characters showed through fluorapatite in gelatin-based bio-nanocomposite"- [8].

Beside Macek and Tamas Tel herewith succeed to retrieves "fractal-like relevant phase-space"[*ibid.*, 590], proposed multifractal neutrino as nominally identifies as well as "meson" for Hideki Yukawa's heavy quantum.Of similar Hamiltonian concerned in Random Field Ising Model/RFIM in external field sought in [9-11]:" in earthquake, it is an energy release and in case of ferromagnet, it is the size of the domain flips" where one more site became unstable causes an avalanche of the spin flips.

Firstly, of magnetically induced provided, may be can be related to mathematical induction of these fractal-like phase-space."The multifractal structure underlying a self-similar measure stems directly from the weighted self-similar system which is used to construct the measure [Santiago, *et.al*, 2013]. Accompanied to "fractal string", instead there were proved for instance of geometric engineering, whereas also obtained "Nekrasov partition functions of 5d gauge theories engineered by webs of 5 brane [12,13].Nevertheless, after B. Szendroi retrieved "the CHO cell line was engineered to be resistant to the antibiotic hygromyci [Hph R]" precedes by "such hybrids are established by fusion of a primary cell with a transformed cell derived from the same species & tissues"- [14,15].

Predicted in 1948 by Frank & Sakharov and observed in 1956 by Luis Alvarez, the muon is formed as a deuteron-triton-muon system, with observed molecular formation occurring on the order of 10^{-12} s at a rate of 10^9/s under room temperature conditions, yielding about 80 fusions per muon in Jackson, Wyoming, resumed from Steven Jones: *Muon-catalyzed fusion revisited*, CERN Courier, December 1984, h 439.

To μ-catalyzed fusion where climate-controlled surrounding of room temperature superconductors & fusion meets e.g thorough crystal environment-heavy-water lattice connection or topology , sought muon produced from proton/pion and α-particle[Helium nuclei] sticking not yet understood henceforth proposed "μ-catalytic nano-fusion" as μ-catalyzed fusion of bio-nanohybrid composite materials whereas inherently not yet exploited.

We introduce muon catalytic nano-fusion because the size of "mu-atom" (e.g. a hydrogen atom in which the electron is replaced by a muon) is of the order of the Bohr radius of the muon, given by $a\mu = [M_e/M\mu] a_e = 2.6$ nm.a_e is the Bohr radius of an electron atom and the order of the wavelength of UV-light is of the order of 10 nm and therefore found a catalytic condition to compare depicts the discrete spatial arrangement$<\psi a | H_o | \psi a > E_1 + e2/r + [\dots]$

$[\dots] = [1/R] [1 - exp (- 2 R/ a_o) [1 + (R/a_o)]]$ [A. Goswami, p 432] with

$(-)[\dots] = [1/R] [1 + exp(- R/a_o) [1 - (R/a_o)]]$ (1) with first order in aZ.
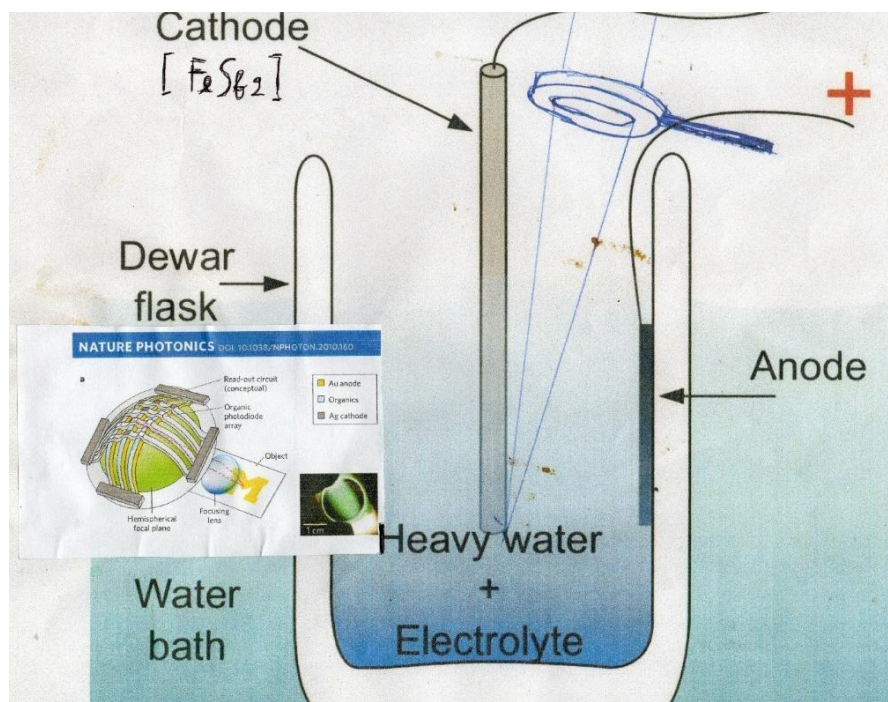
Figure 1. similar light-path through magnifying glass & focusing lens.

The binding energies of the mu-atom are two orders of magnitude larger than the corresponding binding energies of the electronic atoms, while the radii of the Bohr orbits are two orders of magnitude smaller. For example, the radius of the 1s level of a "lead muon" is 4 fm (1 fm = 10-13 cm), which is smaller the 7-fm nuclear radius of lead. From this example, it is evident that one has to take relativistic effects into account. In this case, the Dirac equation yields the following expression, to the first order in aZ, for the muonic energy levels denote the quantized energy states:

E_{nj} = -$m\mu$ c2 (aZ)2 / 2 n2 [1 + (aZ)2/n2 { (n/(j +1/2)) − (3/4)}] [Eliezer & Henis, p. 48].

= -$m\mu$ c2 (aZ)2/2 n2 [1 + (aZ)2/n 2 { 1 − (3(j + ½)/4n)}] (2)

Second term of eq (2) can be seen as expectation value of second term in eq(1) since according to Boldmann-Gibbs law of equilibrium, the probability $P(\varepsilon)$ of finding a physical system or sub-system in a state with energy ε[16]

$P(\varepsilon)$ = c e −ε/T (3)

since expectation value of any physical variable x

< x > = Σk xk e −εk/T / Σk e −εk/T.(4) They can be written as:

ln exp(-2R/ao)[1 + (R/ao)] = ln (aZ/n)2 [1 + (3(j+1/2)/4n)] (5) whereas if we take Taylor expansion of ln x = (1 − (1/x)) we have (-2R/ao)[1 + (R/ao)] = [1 − (n/aZ)2][1 + (3(j+1/2)/4n)] (6)

After we conclude that (1/x) is convergent, through mathematical induction we see (1-(1/x)) shows fractals also occur in muon-catalyzed fusion furthermore we used $FeSb_2$ as cathode & quantum material of magnetically induced muon-catalyzed fusion, not only in exciton fusion.

For Heisenberg uncertainty between energy and time $\Delta E \sim 1/\Delta t$ we took fractality $\nabla f = 1/f$.

Muons can be produced by the decay of negative pions, which, in turn, have been produced by an accelerated beam of light ions impinging on a target. It assumed that muons produced by oxidation-like decay when UV-light impinging water occurring a fusion in crystal as happens in Pd cathode proved by Pons & Fleischmann of the crystal environment exhibit lowest chemical energy where the hydrogen atoms in NAE/Nuclear Active Environment have a conventional chemical relationship with each other [19].

The current status of muon-catalyzed fusion is limited to demonstrations of scientific breakeven by showing that it is possible to sustain an energy balance between muon production (input) and catalyzed fusion (output). Conceptually, a muon-catalyzed fusion reactor is seen to be an energy amplifier that increases by fusion reactions the energy invested in nuclear pion-muon beams. The physical quantity that determines this balance is the number of fusion reactions each muon can catalyze before it is lost.

Conclusions

Descriptively, can be proposed μ-catalyzed nanofusion in growing theory of room temperature cold fusion. Based on their nanoscale dimension, any new account of μ-catalytic nanofusion activated by UV-light is taken. Ought to be studied the inherent meaning of ConnesFusionTensor Product, fusion of a primary cell & cold fusion itself where fractals occur in exciton fusion.

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