Zero Point Energy from the Viewpoint of an Alternative Concept of Space According to the BSM-Supergravitation Unified Theory

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Problems in Theoretical Physics

- **The role of Theoretical Physics** – why it is important
- **Accumulated problems** during the past 100 years
- **Assumptions and postulates**
- **Rules and violation of rules**
- **Replacement of human logic** by mathematical logic – some wrong assumptions lead to wrong conclusions
- **The importance of the concept of space**
- **The wrong opinion** that the currently adopted space concept and postulates are final truth
- **Never answered questions**: How Fundamental Laws of Physics are permanently recorded?; Why the speed of light is constant?; illogical rules in Quantum Mechanics and Particle Physics
- **Solution**: Revision of adopted space concept based on accumulated experiments and observations

Example of wrongly used mathematical logic

- The mathematical concept of a Hilbert space is extending the methods of vector algebra and calculus from representing the three-dimensional Euclidean space to a (mathematical) space with a finite number of dimensions
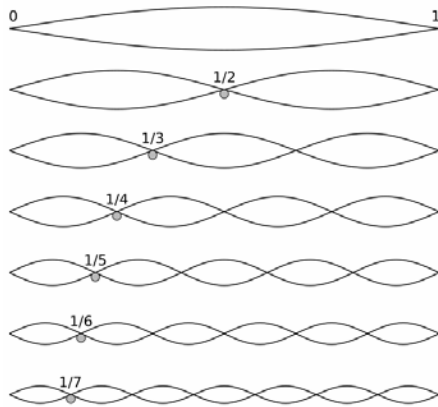

Fig. 1 Example of correct use: To study the harmonics of vibrating strings.

• Incorrect use: If used as a physical space – the assumptions and the results are wrong.
Examples: Hilbert space is widely used in the String Theories, a well funded field with zero practical output. In science fiction: warm holes, other dimensions, hyperspace, time travel.
• Many abstractive theories are based on wrong assumptions hidden in correct mathematical constructs.

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Starting point of the BSM-Supergravitation Unified Theory
Low level structures of indestructible Intrinsic Matter

• **Two superdense fundamental particles (FP)** with length and intrinsic frequency associated to the Planck's length (1.616×10^{-35} m) and frequency (1.855×10^{43} Hz):

• **Supergravitational Law:** defines attractive and repulsive strong forces (SG forces) inverse proportional to the cube of distance in pure empty space

• **In unique process of crystallization** FPs form 3D structures held by the SG forces and possessing vibrational properties

Lowest level formations

Primary Tetrahedron (T)

Quasi Pentagon (QP)

external view   internal view

Quasi Ball (QB)
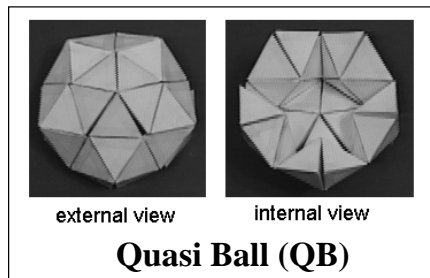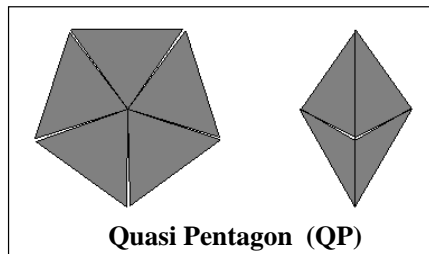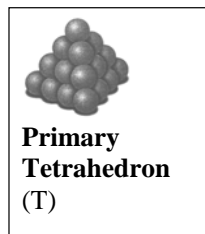
QB can be left or right-hand twisted - 2 bits information

QB = 12 QP = 60 T

QP = 5 T

Total gap between QPs: 7.355^0

The trend T -> QP -> QB repeats in the upper level of formations.

Every consecutive formation have a common mode vibration whith a frequency that is a division of the frequency of the previous formation. This is a natural mechanism for division of the superhigh Planck's frequency.

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In a unique process of crystallization the QBs compressed in a shell form prisms with unique properties

Prism with embedded handedness
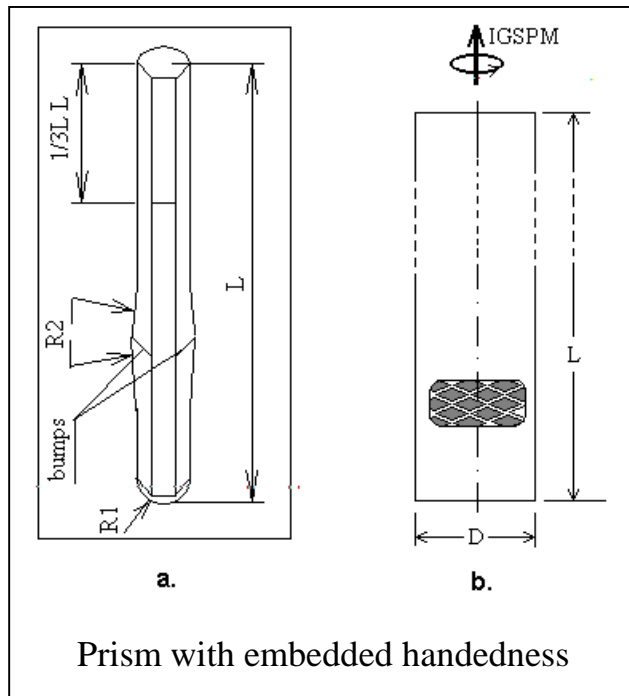
Two types of prisms of two intrinsic matter substances with left-hand and right-hand internal twisting
- Axial SG filed
- Rotational SG component
- Length ratio 2:3

Cosmic Lattice (CL) and Supergravitational Law

Cosmic Lattice: two types of flexible CL nodes held by SG forces. Each CL node is comprised of 4 prisms possessing internal superdense structure.

• **The prisms** are not externally twisted but having **internal twisted structure** (discussed elsewhere)
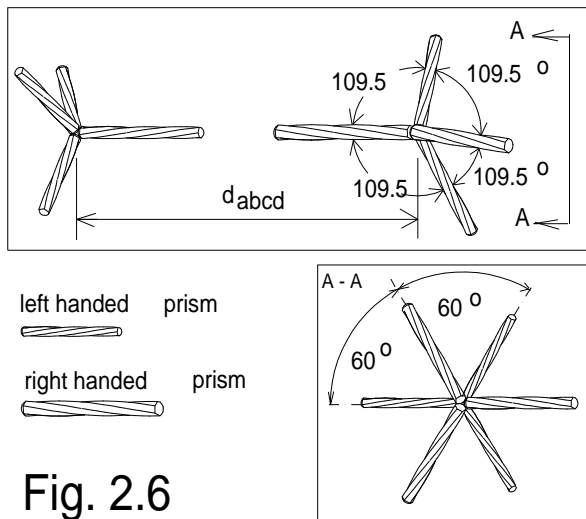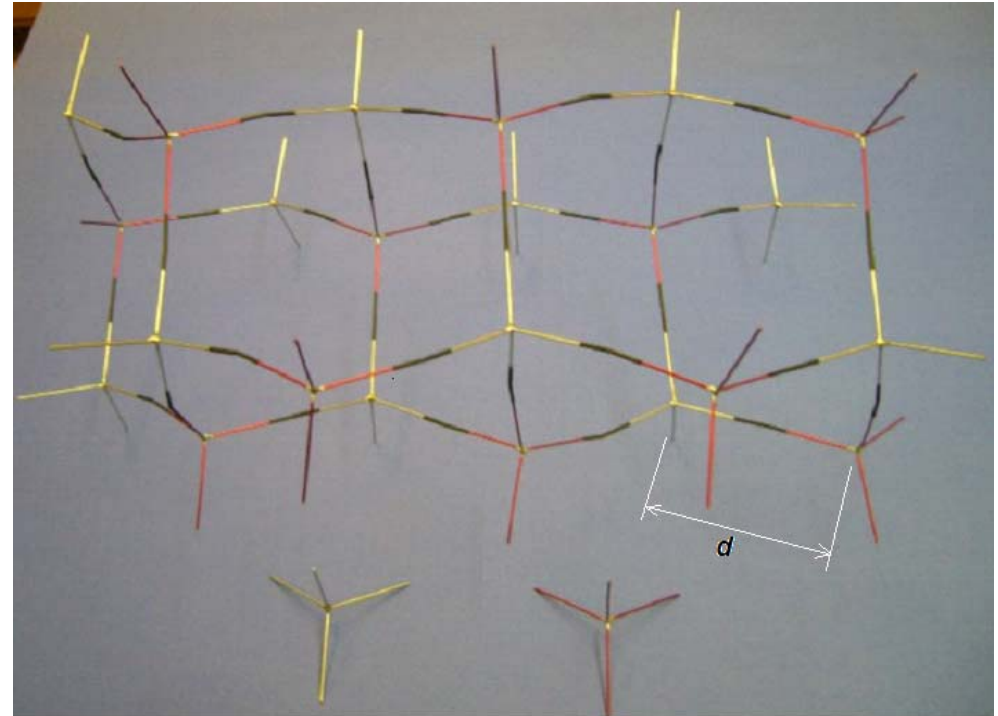

Fig. 2.6

$$d_{abcd} \approx 0.5 \times 10^{-20} \ (m)$$

Mock-up demonstrating the CL structure
Red color – right handed CL nodes
Yellow color – left handed CL nodes
Black color - gaps

Dynamical Properties of the Cosmic Lattice (Physical Vacuum)

- **Gaps between the CL nodes:** permit spatial CL node oscillations under SG law
- **Return forces:** - along **xyz** axes (weak forces) and along **abcd** axes (strong forces).
- **CL node oscillations** - two frequencies : $f_R = 1.09 \times 10^{29}$ Hz – NRM (Node Resonance Momentum) and $f_c = 1.236 \times 10^{20}$ Hz (Spatial Precession Momentum = Compton frequency)
- NRM vector defines the speed of light; SPM vector defines the constancy of speed of light
- MQ SPM (Magnetic Quasisphere – a hodograph of SPM in absence of electrical charge)
- **EQ SPM** (Electrical Quasisphere – a hodograph of SPM vector in electrical field or charge)
- A loop of synchronized MQ SPMs: define a **magnetic line**
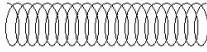- Synchronized EQ SPM: defines the **electrical lines** of a charge + and – (left and right)
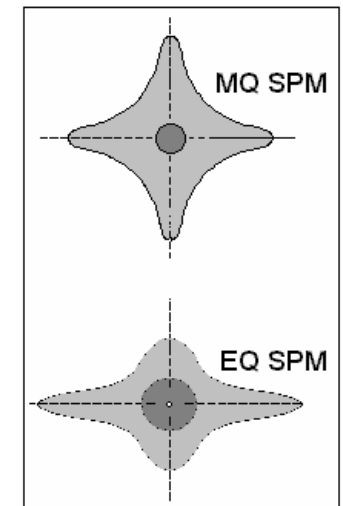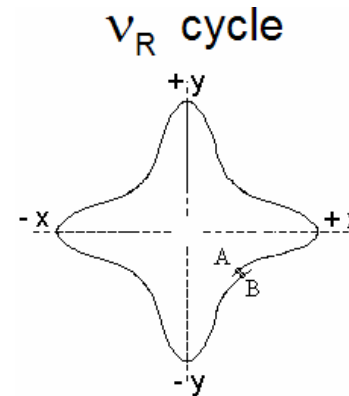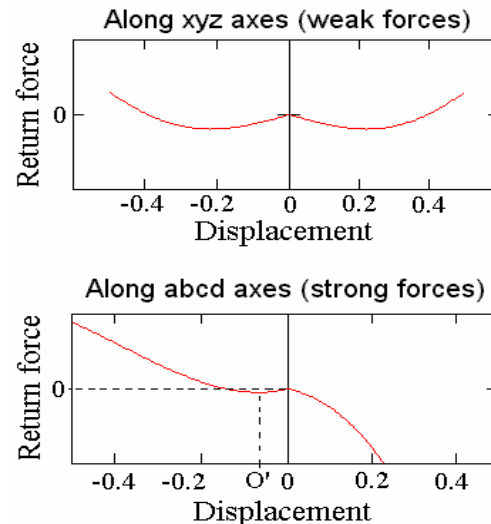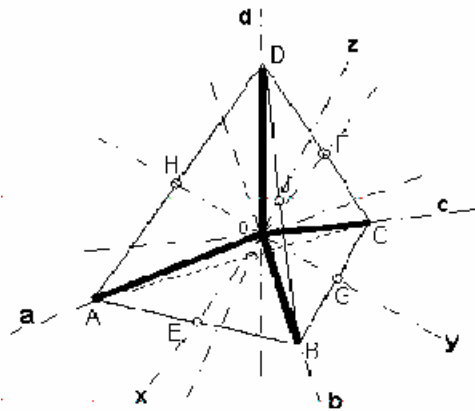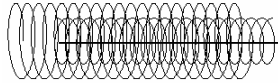
Helical Structures crystallized from the two types of prisms (with internal twisting)
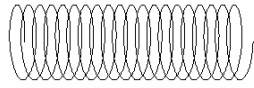
Right-Hand

Left-Hand

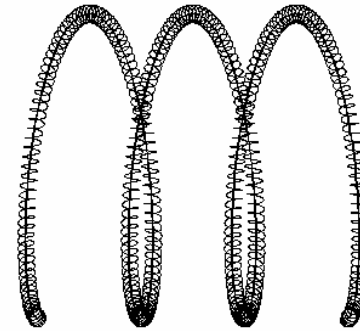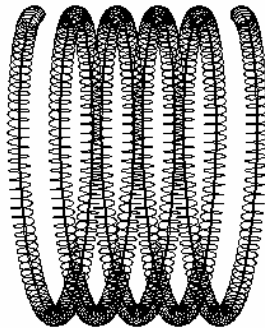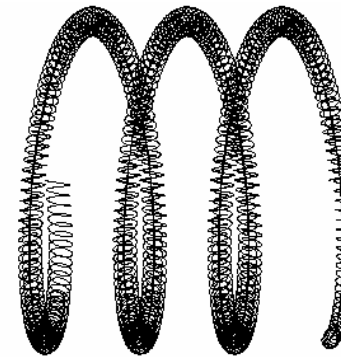**Combined**

Second order LH structure

Second order

Second order RH combined structure

All stable elementary particles: neutron, proton, electron and positron are made of helical structures

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- **Electron** – an oscillating 3-body system of helical structures with two proper frequencies. <u>The first one is the Compton frequency equal to the SPM frequency of the CL node.</u>

oscillating electron
motion of 1
1
r_e
s_e
3
r_p
2
motion of 2
R_c
$R_c = 3.86 \times 10^{-13}$ (m)

FOHS with internal RL lattice
untwisted cell   twisted cell
d_1
d_2
a. $d_1 > d_2$ b.
untwisted and twisted FOHS

CL space
RL
E-field lines
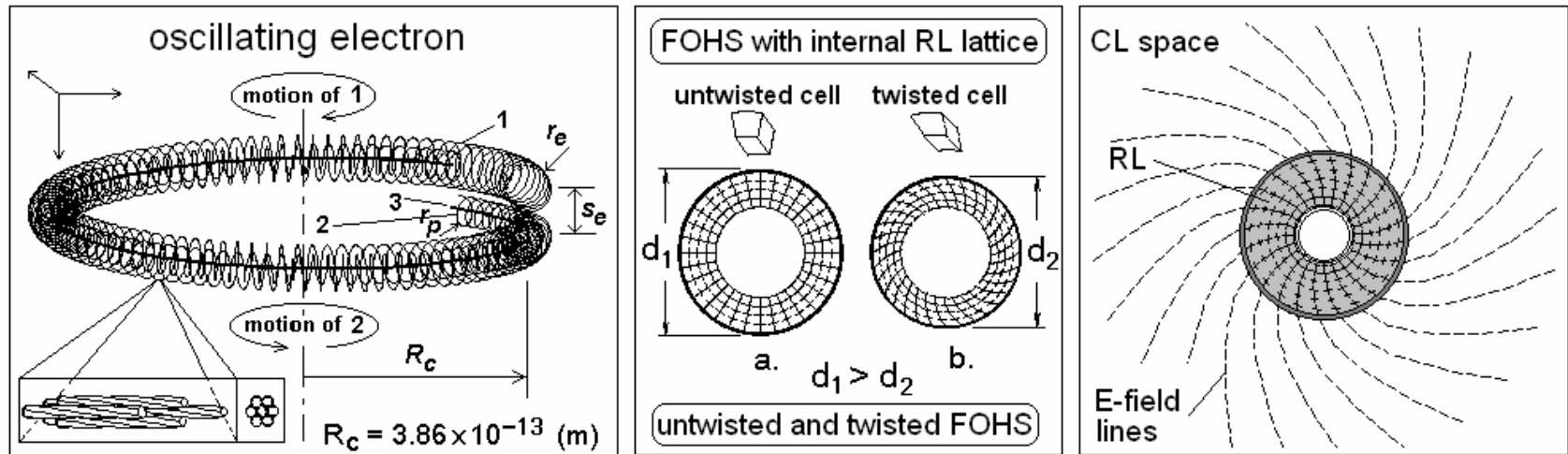
- **Confined motion:** A screw-like motion of rotating and oscillating electron interacting with the oscillating CL nodes. Preferred velocities, corresponding to (13.6/n) eV, where **n** matches the principal quantum number of the Bohr atomic model. **Quantum orbit**: a closed loop containing a hole number of both frequency cycles.
- The **denser internal RL lattice** modulates the CL node dynamics creating electrical and magnetic lines

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The mysterious Dark Energy according to BSM-SG: Two types of Zero Point Energies of the Physical Vacuum

- **Static ZPE energy**: It is related to CL pressure exercised on impenetrable volume of the elementary particles (not envisioned by Quantum Mechanics)

$$P_S = \frac{m_e}{V_e} c^2 = \frac{g_e h v_c^{\,4} (1 - \alpha^2)}{\pi \alpha^2 c^3} = 1.3735 \times 10^{26} \qquad (\text{N/m}^2) \qquad (1)$$

  The Static ZPE defines the Newtonian mass of the elementary particles according to the **Mass equation** (2) derived in BSM-SG:

$$m = (P_S / c^2) V_H \quad (\text{kg}) \text{ - \textbf{Newtonian mass equation of elementary particle}} \quad (2)$$
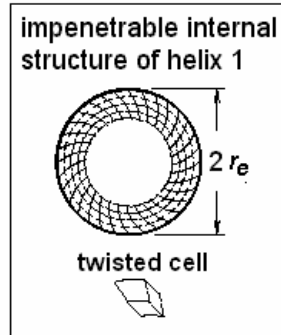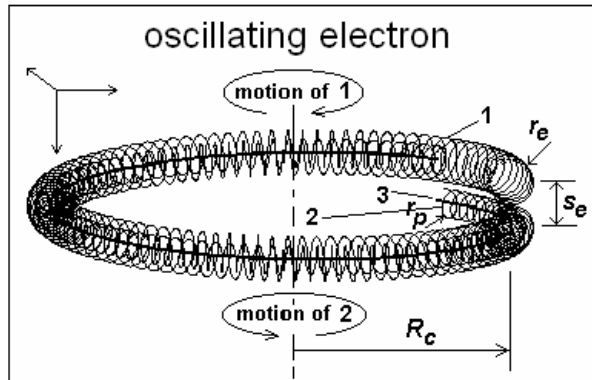
  where: V_H – is the impenetrable volume of the elementary particle

- **Dynamic ZPE**. BSM-SG definition: It is related to the dynamical pressure exercised on elementary particles atoms and molecules by ZPE waves that equalize the CL space background energy (envisioned but not explained by Quantum Mechanics)

$$P_D = \frac{h v_c}{c S_e} = \frac{g_e h v_c^{\,3} (1 - \alpha^2)}{\pi \alpha c^3} = 2.0258 \times 10^3 \quad (\frac{N}{m^2 Hz}) \qquad (3)$$

- The static ZPE (related to the mass) is behind the Einstein equation: $E = mc^2$
  Signature of Static ZPE energy: Casimir forces
- Dynamic ZPE is responsible for the Electric and Magnetic field and the constant speed of light. Signature of Dynamic ZPE: The background temperature of 2.72K .

The Hidden Static Zero Point Energies of the Physical Vacuum estimated by the unveiled structure of the electron

oscillating electron

motion of 1

motion of 2

R_c

impenetrable internal structure of helix 1

twisted cell

$R_c = 3.86159 \times 10^{-13}$ (m)

$r_e = 8.8428 \times 10^{-15}$ (m)

$r_p = 5.8952 \times 10^{-15}$ (m)

$s_e = 1.7706 \times 10^{-14}$ (m)

The Static CL Pressure is exercised on the impenetrable volume of the electron, V_e, estimated from its identified physical dimensions with a shape of a cut torus having a large radius R_c - (Compton radius) and a small radius $r = 8.8428 \times 10^{-15}$ (m).

$$V_e = 4\pi^2 R_c r^2 = 5.96 \times 10^{-40} \ (m^3)$$

According to mass equation, the electron mass is:

$$m = P_S V_e / c^2 = 9.109 \times 10^{-31} \ (kg)$$

Using Einstein equation $E = mc^2$ we have:

$$E = 8.187 \times 10^{-14} \ (J) \equiv 511 \ (keV)$$

Scaling this energy in a volume of V_e to the volume of 1 cubic cm we obtain the **value of ZPE-S energy**:

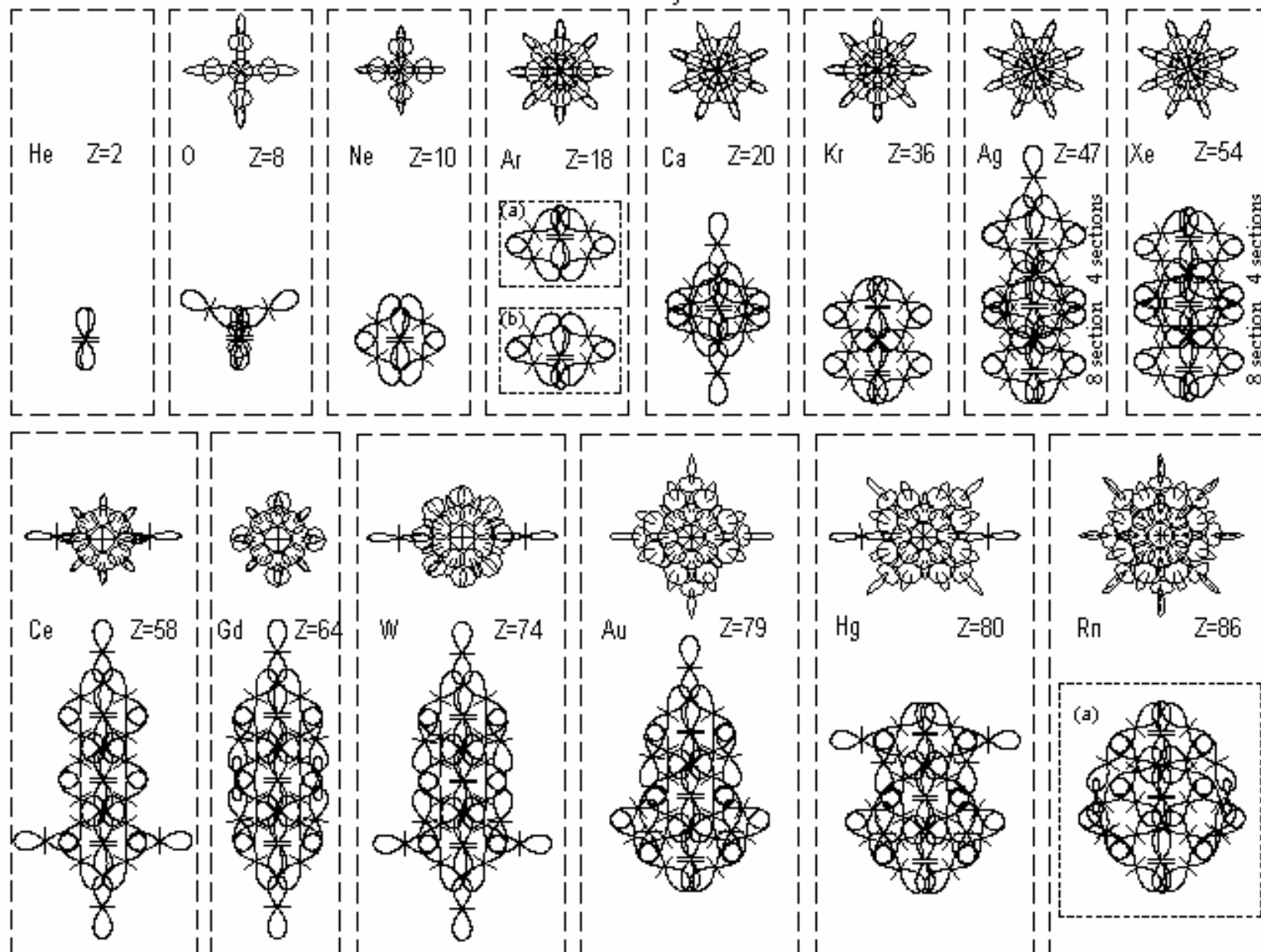$$E_S = 1.3736 \times 10^{20} \ (J) \equiv 3.8 \times 10^{13} (KWH)$$

• **Every cubic cm of space contains 3.8x10¹³ (KWH) hidden energy, directly related to mass - a primary source of the nuclear energy !!!**

• In Hot Fusion and Fission the Static ZPE is directly accessed. The radioactive byproducts are result of the strong CL space disturbances.

• Properly selected cold fusion methods do not provide radioactive waste

BSM-SG: Protons and neutrons in the atomic nuclei
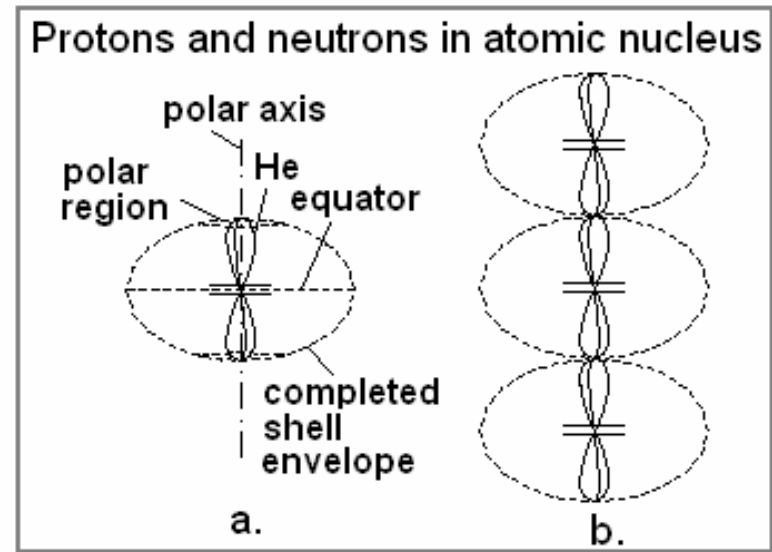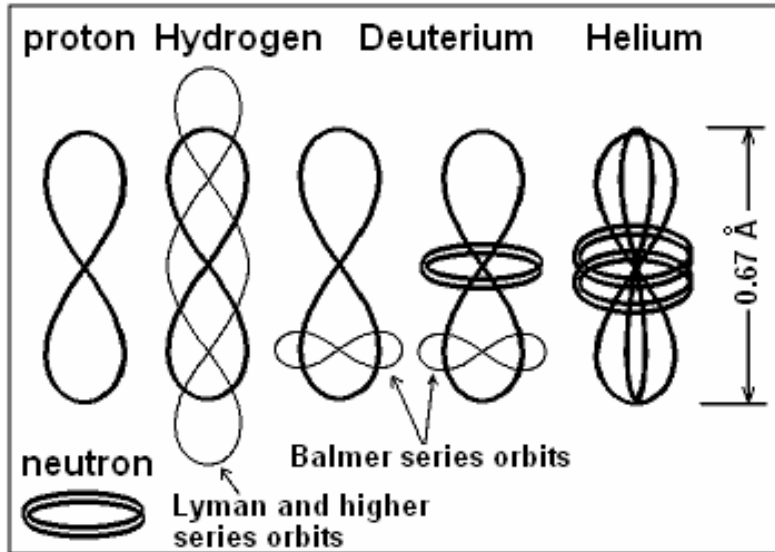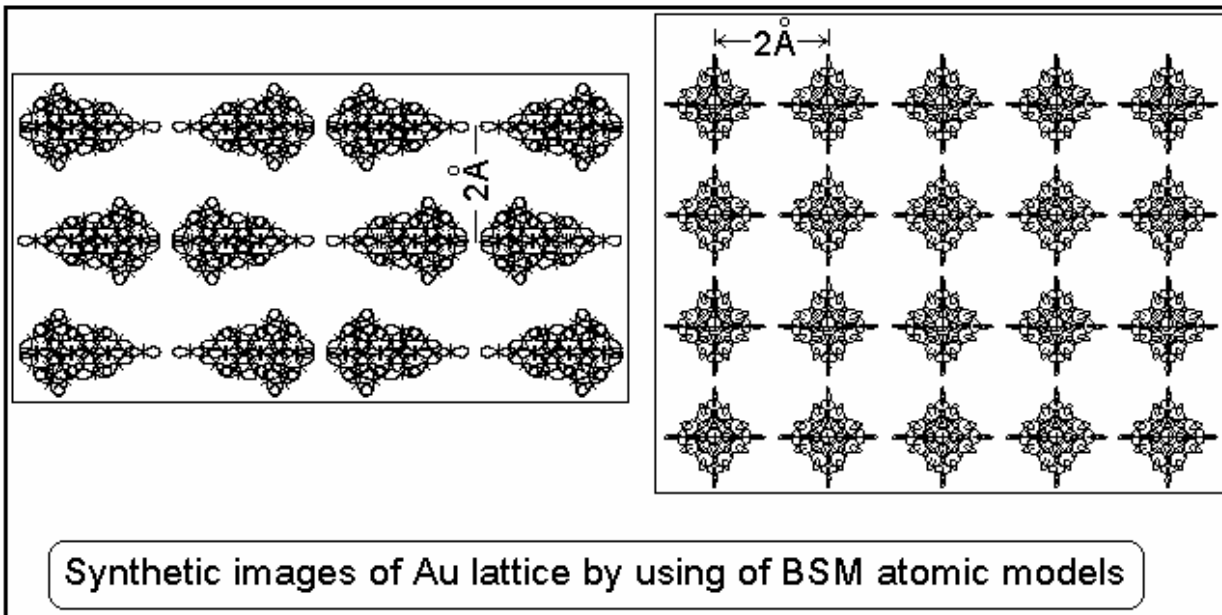

The Atlas of Atomic Nuclear Structure is one of the major derivatives from the BSM-SG theory. It explains the raw and column pattern of the Periodic table, the valences, the Pauli exclusion principle, the Hund's rule, the oxidation number, the nuclear spin (NMR), the p-type of electronic orbits, the radioactivity and other properties.

BSM   Atlas of atomic nuclear structures   Projection views of selected elements

He   Z=2

O   Z=8

Ne   Z=10

Ar   Z=18
(a)
(b)

Ca   Z=20

Kr   Z=36

Ag   Z=47
8 section 4 sections

Xe   Z=54
8 section 4 sections

Ce   Z=58

Gd   Z=64

W   Z=74

Au   Z=79

Hg   Z=80

Rn   Z=86
(a)

Note: (a) and (b) are polar sections of the nucleus with two selected planes. The angle between them is 22.5^0

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Comparison between metal lattice images from a tunneling microscope and synthetic images using BSM-SG models

Images of two crystal planes of gold layer. Cortesy of T. Kawasaki et al., App. Phys. Lett, 76, No 10, 1342-1344 (2000).

FIG. 2. (200) lattice fringe ($d = 2.04$ Å) images of a Au(001) thin film: (a) 1/3 spacing fringes formed from ($\bar{2}00$) and (400) reflections, and (b) fringes formed from many high-order reflections. The Fourier transform of the micrograph extends to ~0.5 Å

Synthetic images of Au lattice by using of BSM atomic models

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Some atomic nuclei according to Dr. Kanarev
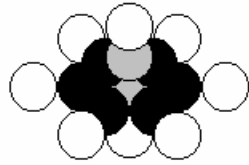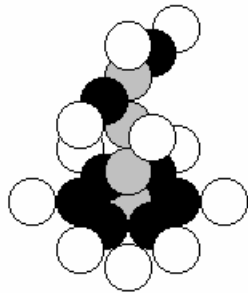
O (8,8)   Na (11,12)   Al (13,14)   Cl (17,18)

Courtesy of
Ph.M. Kanarev

http://guns.connect.fi/innoplaza/ene
rgy/story/Kanarev/coldfusion/index.
html

K(19,20)   Ca (20,20)   Cr (24,28)   Fe (26,28)   Cu (29,34)

15
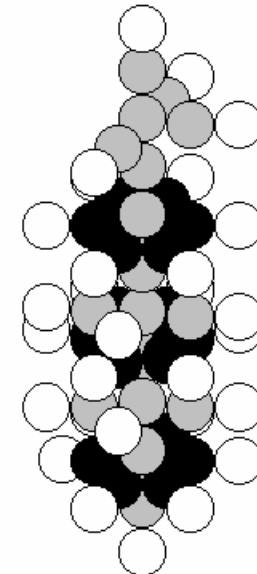
Nuclear energy: accessing the strong nuclear forces

- According to BSM-SG, the **nuclear forces are SG forces at close distance**. The same forces are between the CL nodes. The primary source of nuclear energy is the hidden space energy expressed by the Static CL Pressure
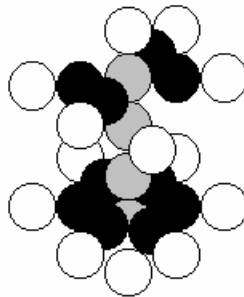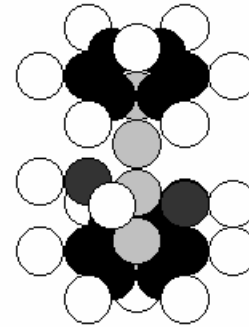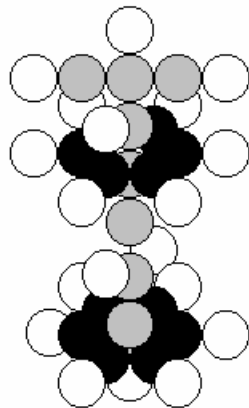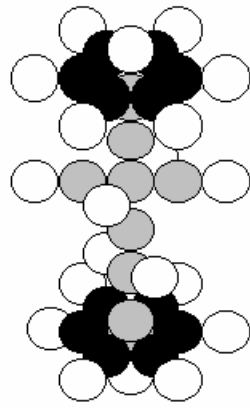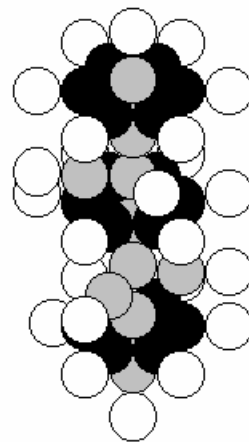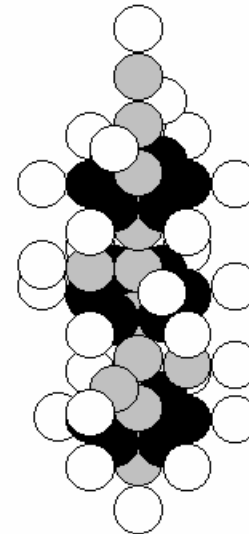
- BSM-SG discovered a **General Relativistic effect at micro-scale**: The atomic nuclei make space micro-curvature that depends on their mass (Detectable signature – Lamb shift).

- In fission and fusion nuclear reactions the **change of mass causes a change of the space micro-curvature**. This invokes a micro-shock in CL space that causes a release of a fraction of the Static Zero Point energy.

- While **Quantum Mechanics postulates** that all particles are spherical, only a hot fusion and a fission by slow neutrons with radioactive byproducts are recognized.

- **Revealing the complex 3D structure of atomic nuclei** opens a new understanding for a possibility of cold fusion and nuclear transmutation without radioactive byproducts.

- **22 years of non-officially recognized Cold fusion or LENR** (Low Energy Nuclear Reactions) after pioneering experiments of Fleischmann & Pons. Theory and experiments of Dr. R. M. Santilli, prof. Kanarev and others.

- **2011: Announcements of Rossi-Focardi method** and reactor based on nuclear fusion Ni + H -> Cu (2011). **Ouptut/Input power ratio: ~ 200**.

Radioactivity according to BSM-SG. Alpha decay - a cold fusion of nuclear reaction D + D -> He
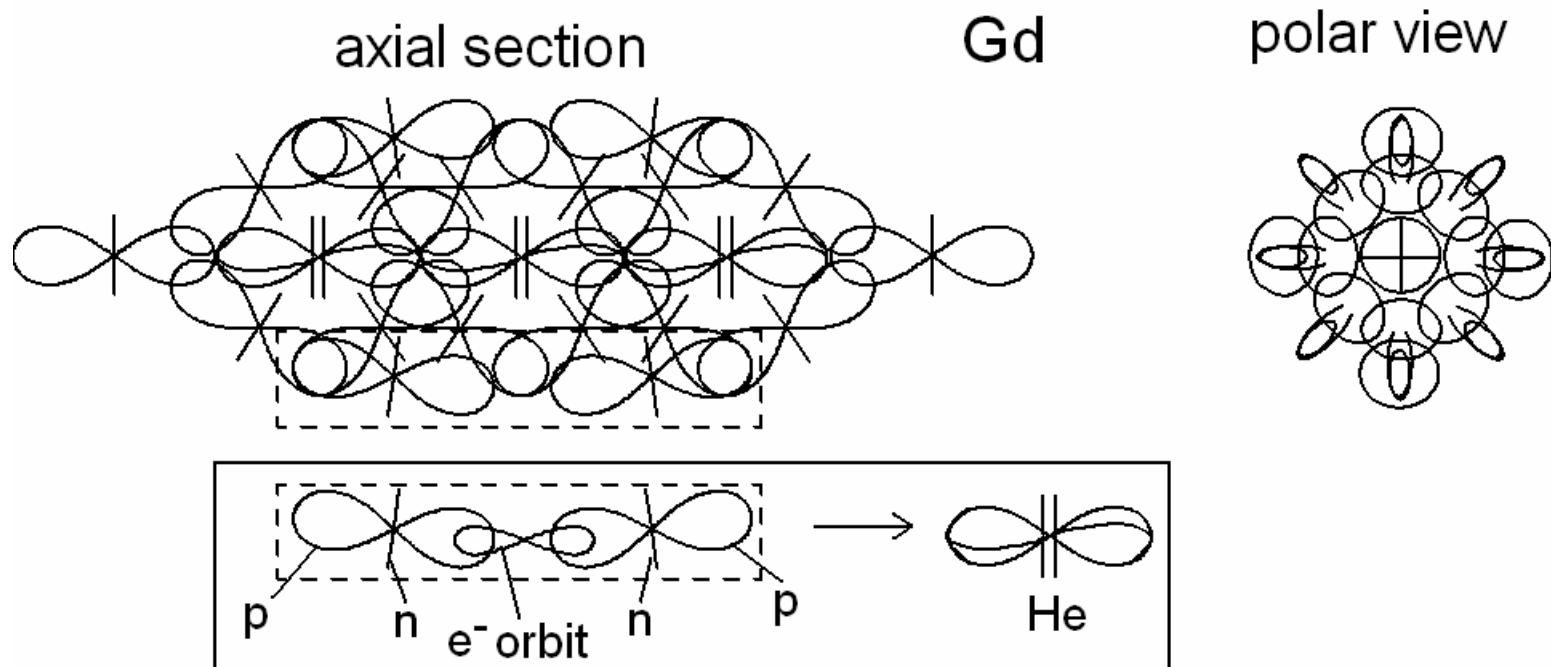
Analysis of observed cold fusion transmutation based on nuclear reaction Pd + D -> Ag using BSM-SG models
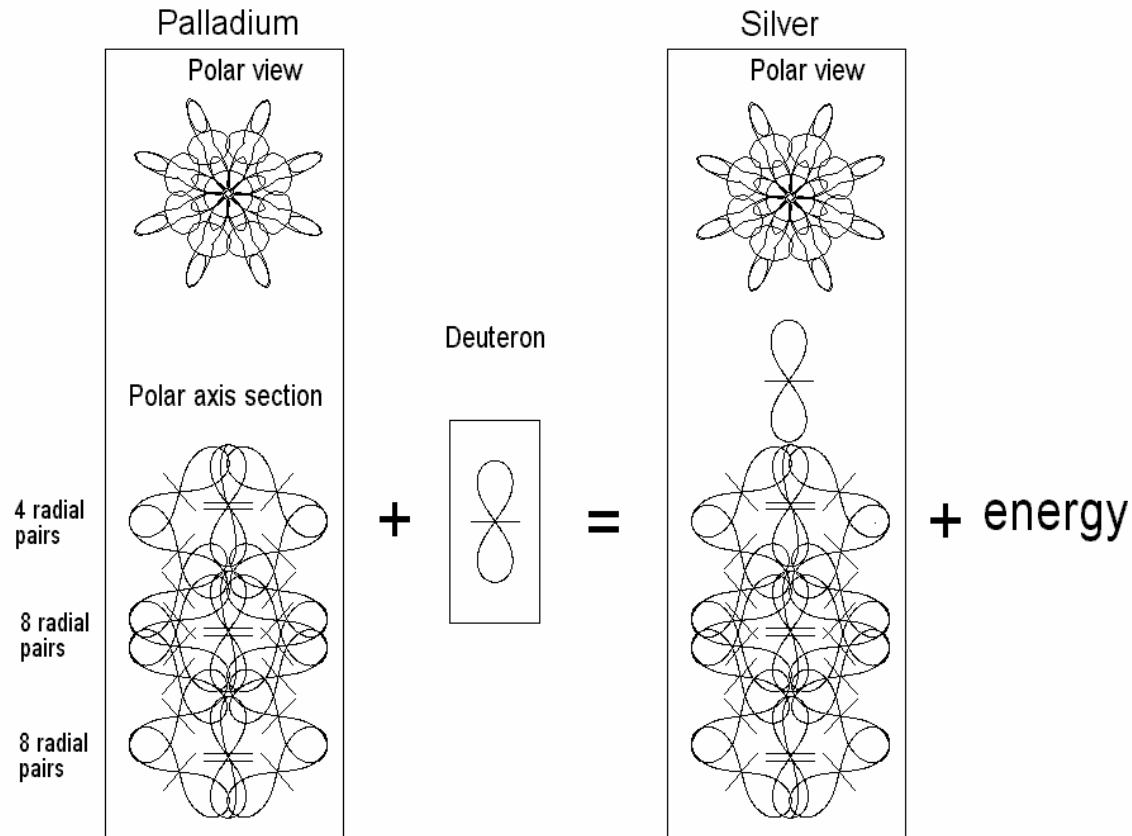
Fox, H.: *Fusion Facts* (July 1995)
Fox, H.: *Infinite Energy* (July-August 1995), p 8-11.
T. O. Passel, Pd-110/Pd108 ratio ….Tenth Int. Conf. on Cold Fusion, 2003, Cambridge, MA

Analysis of Ni + H -> Cu cold fusion reaction realized by the Rossi-Focardi method
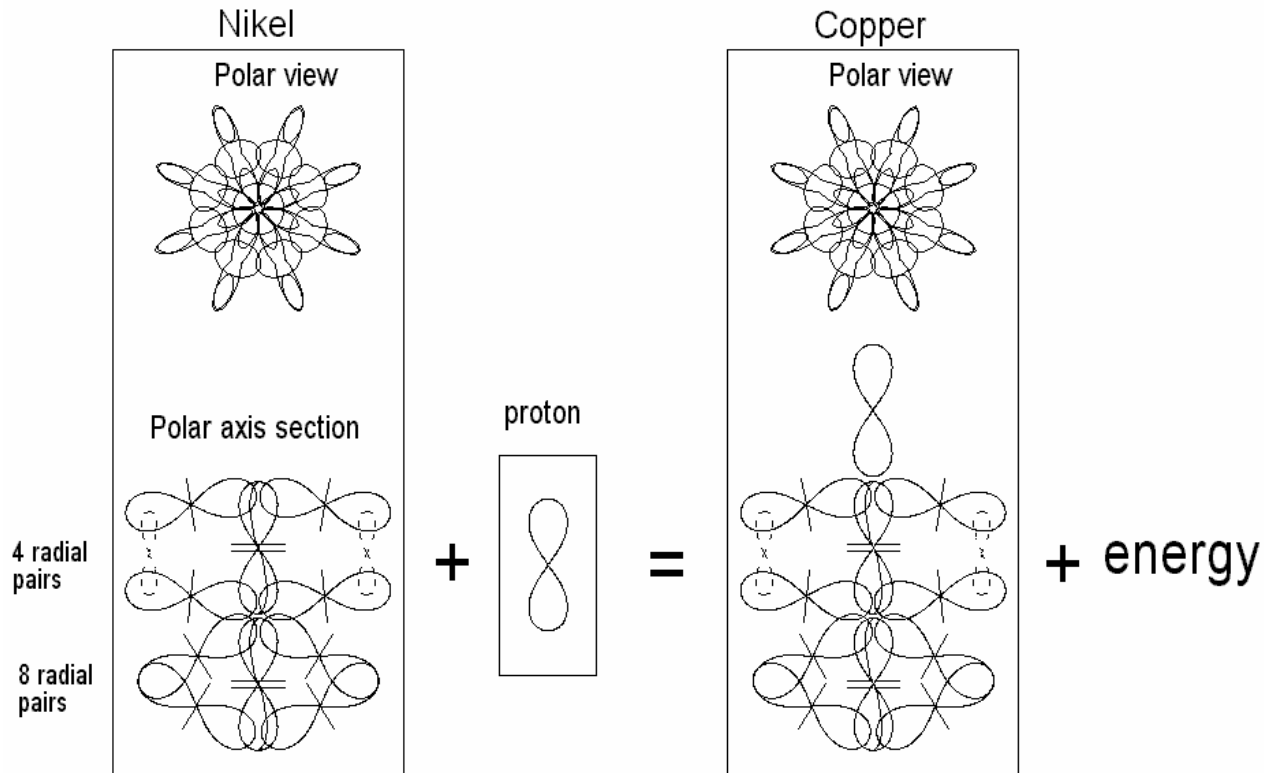
BSM-SG prediction for a reaction Cr + H -> Mn using the heat + pressure method similar as in Rossi reactor
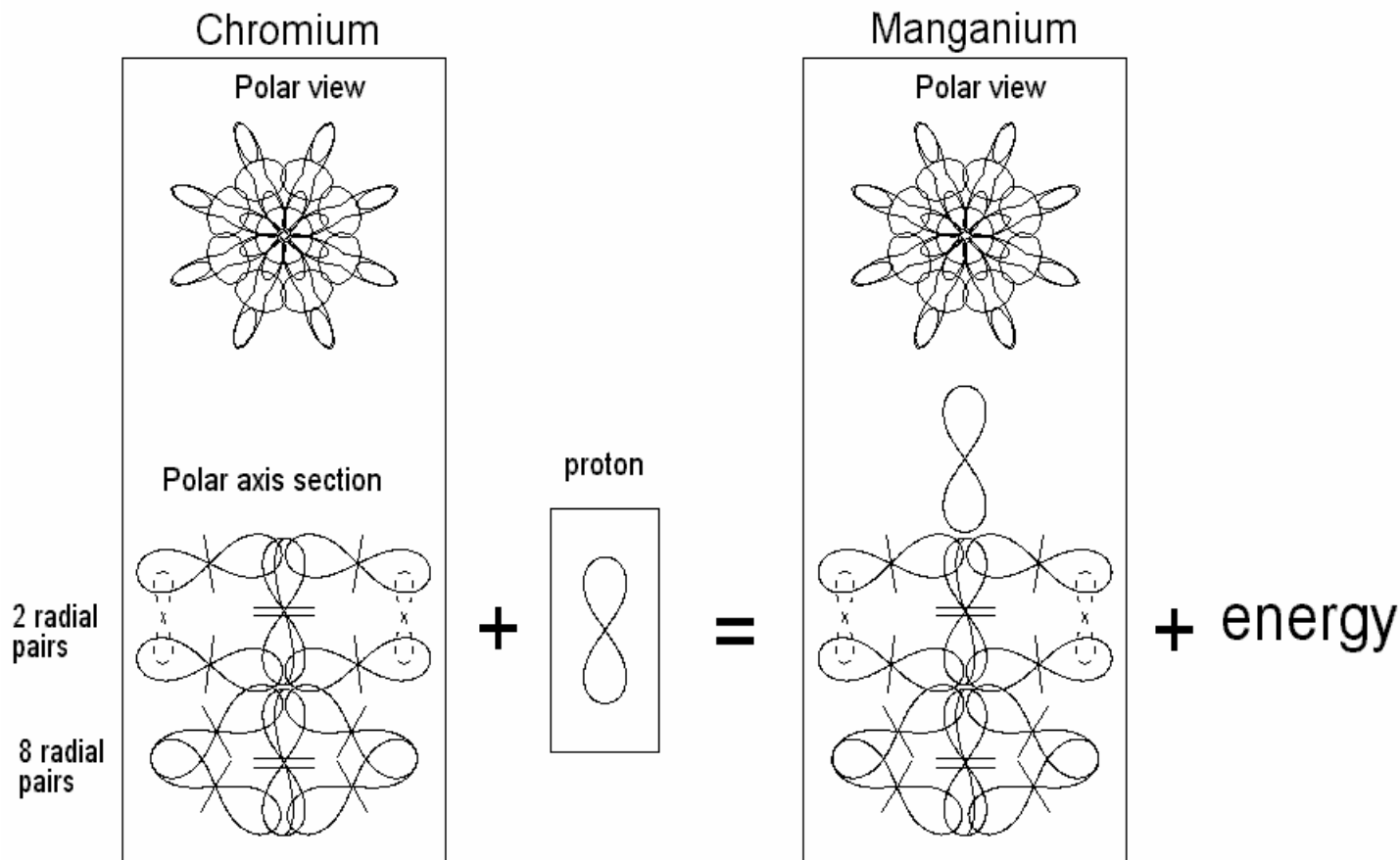
Another option for accessing the hidden space energy predicted by Nikola Tesla *Through space there is energy*

Nikola Tesla (1931): The conception, the idea when it first burst upon me was a tremendous shock. I can only say at this time that it will come from entirely new and unsuspected source and will be for all practical purposes constant day and night. … The installation will be indestructible and will continues to function for any length and time without additional expenditures. It is nothing to do with atomic energy.

Original source: Tesla at 75, Time, July 20, 1931, pp. 27-30).
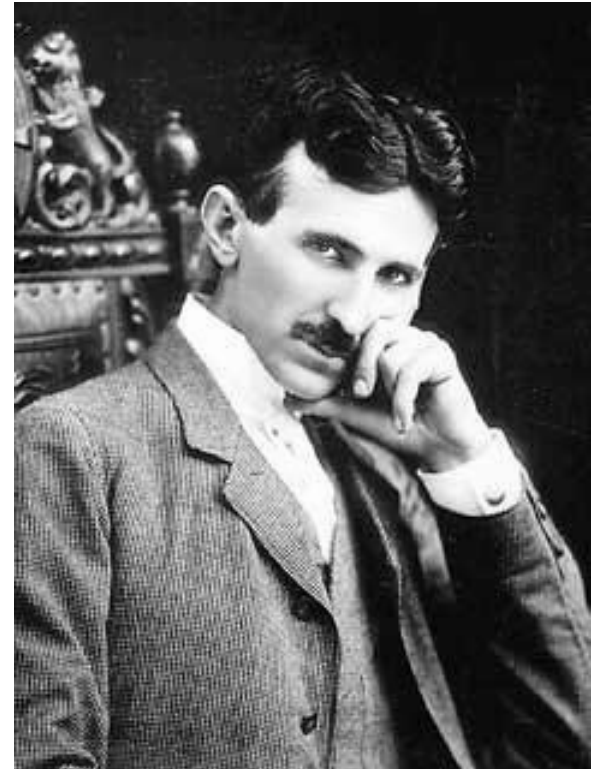
BSM-SG: Heterodyne Resonance Method (HRM) for accessing the hidden space energy

• The Heterodyne Resonance Method (HRM) allows **accessing the Superhigh Compton frequency of 1.2356 x 10²⁰ Hz** (an intrinsic parameter of the CL structure (physical vacuum) by using the oscillation properties of the electron.

• HRM is invoked in **EM activated plasma**. Formation of ion-electron pairs.

• The ion-electron pairs moves reversibly while the electron trace is helical one, centered on the trajectory of a heavier positive ion. The electron moves with his **optimal quantum velocity** corresponding to energy of 13.6 eV.

• The alternative motion leads to **quantum mechanical spin flip of the electron** (interaction with the CL space) in which **a fraction of the ZPE is extracted**.

• The HRM allows **accessing the Compton frequency** of by EM frequency in the kHz range (depending on working gas and pressure).

• Due to larger magnetic moment of electron the ion-electron pairs form **clusters**

Ion-electron pair

1. positive ion trajectory
2. Electron trajectory
3. Magnetic lines from electron motion
4. Activated electrodes
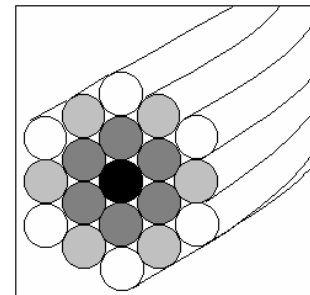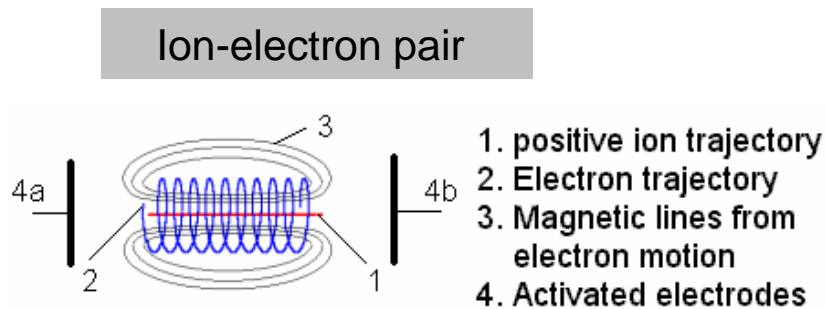
Cluster of ion-electron pairs

Technical method for invoking of the HRM

- **Working medium**: a properly selected gas or gas mixture
- **Electrode design** (envisioned by Tesla)
- **Creation and activation of a cold plasma** by electrical pulses with a proper amplitude, duration and repetition rate, causing:

  - ionization and electron acceleration

  - accelerated electrons combine with positive ions forming ion-electron pairs, while the electron momentum transfers to the pair

    - the ion-electron pair behaves as a neutral system but with predominated magnetic moment of the electron. This allows formation of clusters of ion-electron pairs.

  - the QM interaction of the electron with the physical vacuum at Compton frequency causes a reversible oscillation of the pairs.

  - at number of oscillation cycles (depending on activating conditions) a spin flip of the electrons occurs. This interaction involves access to the hidden space energy.

- The magnetic field created by the electrons exhibits a **characteristic spectrum**. This permits implementation of a proper control.

HRM experiments in partial vacuum and normal air. Simplified circuit diagram

Sarg self-oscillating circuit based on HRM
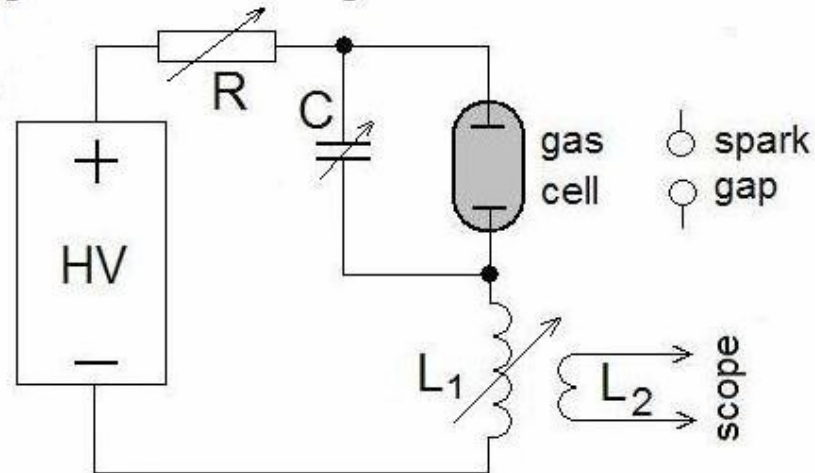
Notes: 1. A gas cell at partial vacuum
or a spark gap at open air
2. The burst frequency is in a KHz range;
the HRM frequency is in a MHz range
3. RC group defines the burst rate
4. The frequency spectrum of HRM is
defined by L1 and gas cell parameters

Experimental setup for study of HRM effect in partial vacuum (the vacuum pump is not shown)
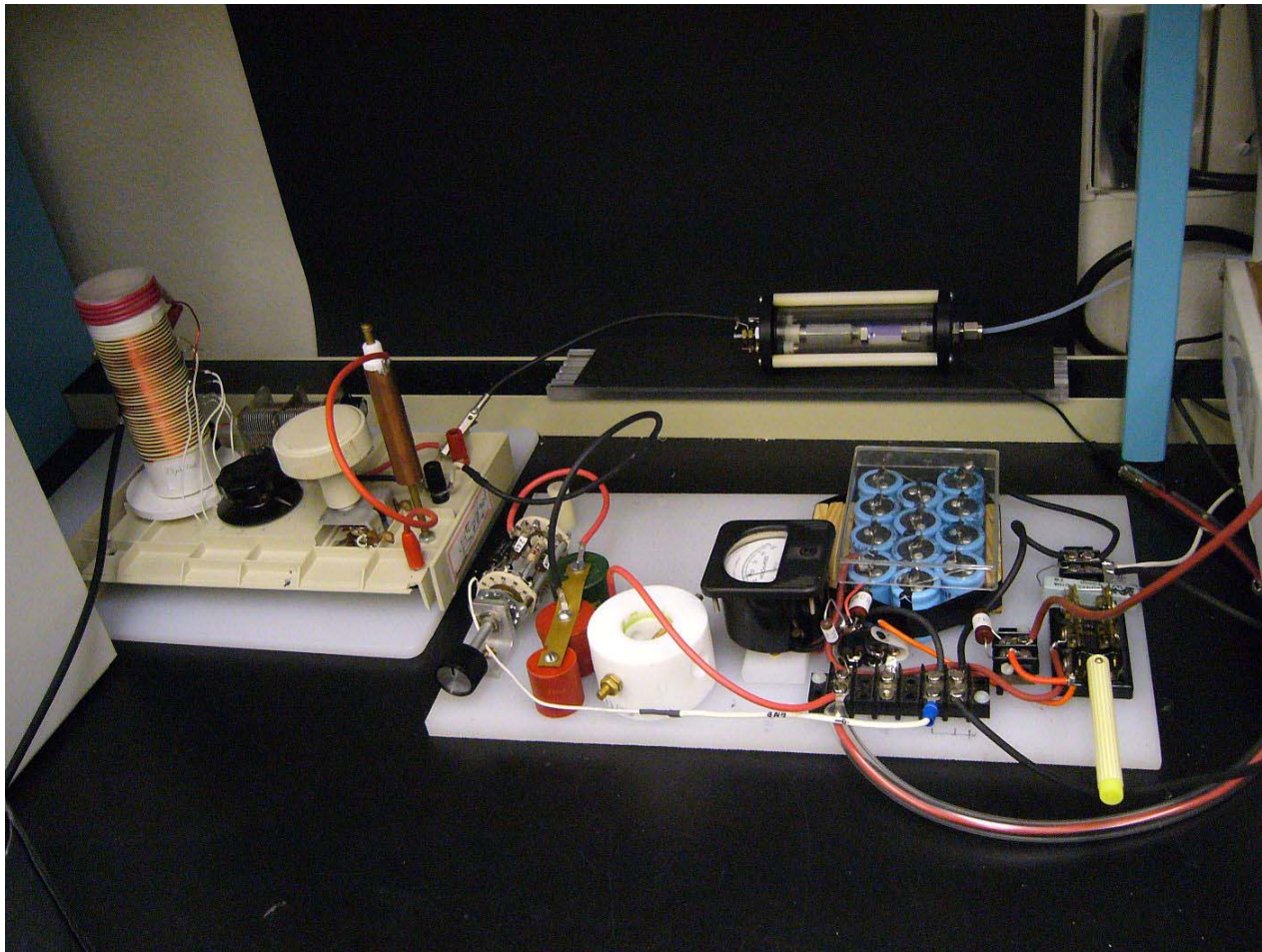
Heterodyne Resonance Mechanism.
Optical and EM signatures

GLOW IN PARTIAL VACUUM

GLOW FROM DIFFERENT GASES

Radio spectrum signature of clusters from oscillating ion-electron pairs
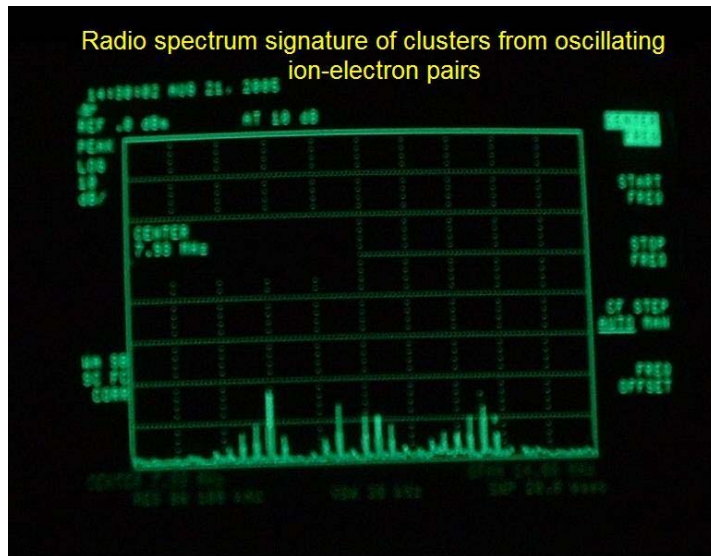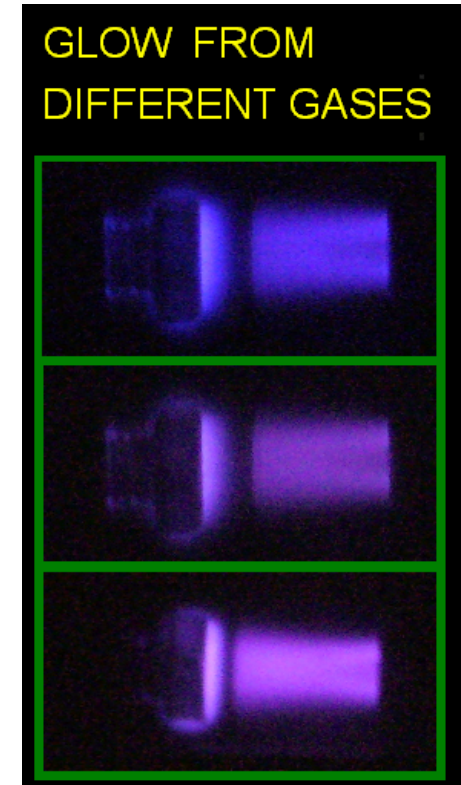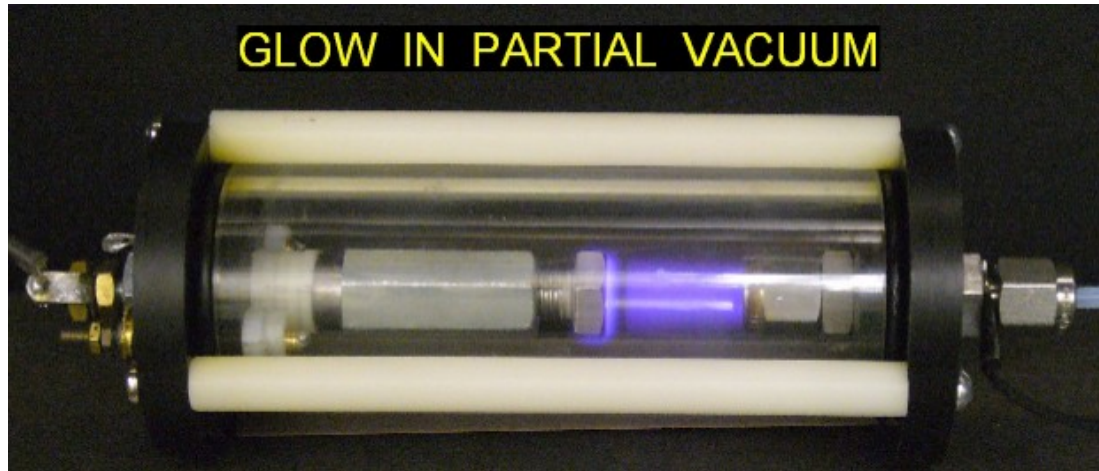
The comb-like spectrum is a signature of the ion-electron pair clusters

Signature of electron spin flip in HRM effect in partial vacuum

HRM is activated by electrostatic pulse. Design parameters:
• Electrode design (observe Tesla concept of voltage pressure)
• Selection of proper gas or gas mixture
• Selection of the gas pressure
• Amplitude and repetition rate of the activating HV pulse
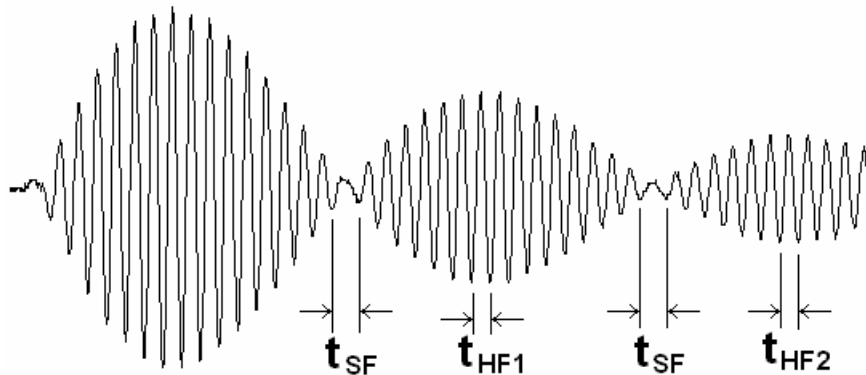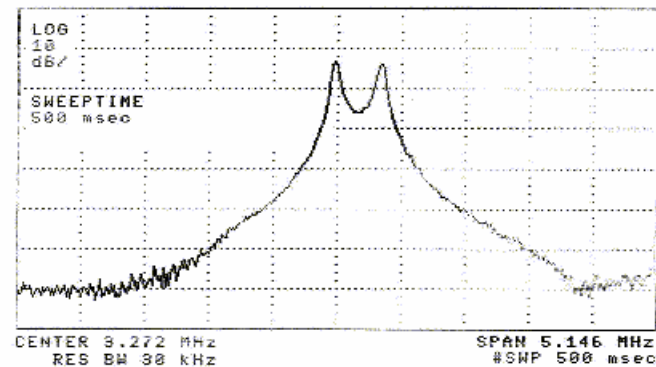
a. - measured waveform showing the moment of spin flip;
    t_{HF1} and t_{HF2} – cycle periods of the two frequencies
b. - spectrum showing frequency peaks corresponding to up and down spin of the electron

Signature of HRM effect in different experiments

- The phenomenon called Radian Energy discovered by Nicola exhibits signatures of the HRM effect
- Dr. Thomas H. Moray, Radiant energy device (1924)
- Edwin Gray motor (USA)
- Testatika device of Paul Bauman – (Switzerland) <u>youtube</u>
- Dr. Aleksander Chernetski self generating discharge (Russia)
- Pablo and Alexadra Correa PAGD device (Canada)
- Pap's engine
- Many experiments involving a glowing plasma
- Some devices using a spark gap in a specific mode of operation
- Antigravity research (successful experiments exhibit signatures of HRM phenomenon, while the physics was not understood).

Why the Heterodyne Resonance Mechanism was not envisioned by Quantum Mechanics

Bohr model of hydrogen

n = 3
n = 2
n = 1
proton
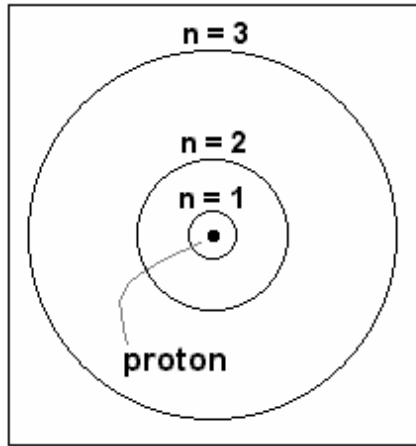
H and D atoms providing spectra

Hydrogen   Deuterium

0.67 Å

neutron
Balmer series orbits
Lyman and higher series orbits
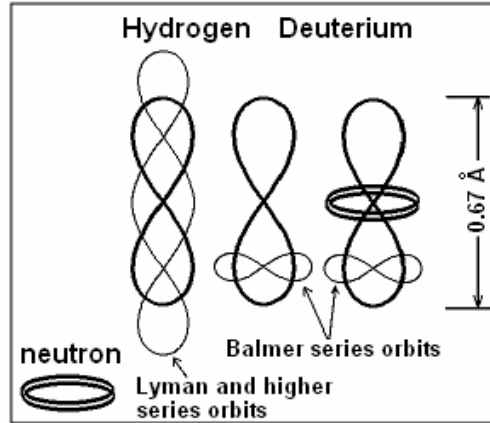
p and e in HRM mode
no optical & IR spectrum

proton   e orbit in HRM

e orbit in HRM
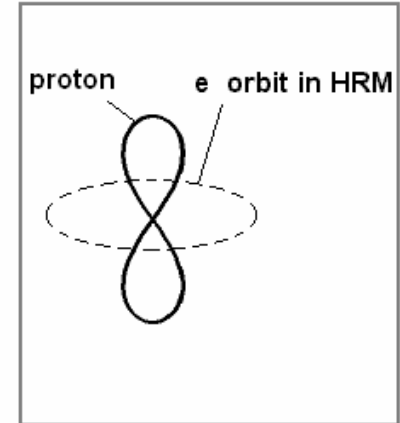
The Quantum mechanical model of atoms is mathe-matical, based on the Bohr model of hydrogen. The problem "Why the rotating electron does not radiate, while its magnetic moment is 630 times larger than this of the proton?" is unsolved enigma.

In BSM-SG atomic models the SG law defines the strong nuclear forces and also the electrical and magnetic fields in CL space. The electron orbiting in a neutral atom passes through the proton whole and the SG field prevents escaping of any EM radiation. For ionized atom the electron appears outside of the Rydberg energy level, which is a limit for the SG field. Then its magnetic moment is detectable. Such ion-electron pair has very unique properties.

Nicola Tesla vision about accessing the ZPE

• Today, Ignoring the existence of the Ether many physicists and researchers wrongly consider that Nicola Tesla intended to derive energy from the ionosphere. <u>Tesla envisioned that the source of ZPE is in the Ether, so it is everywhere.</u> <u>Experimenting with ionosphere is dangerous.</u> Tesla knew this when mentioning the possibility of causing of weather change or earthquake, but he did not release his knowledge.

• **In Colorado Spring**, Tesla obtained valuable know-how for access to this energy and the danger in improperly use (the dangerous plasma balls and the burning of the power plant generator).

• In the **Wardenclyffe project** Tesla considered energy derivation not from ionosphere, but from the space surrounding the top of the Magnifying Transformer. (extract from Vassilatos book)

• **The analysis** of Tesla coils with multi-spark gap reveals that the HRM effect takes place.

• Tesla was the first investigator of the **biological effects from the longitudinal (scalar) waves** – a field requiring much more research but not envisioned by the contemporary physics and many ZPE researchers

The big danger from improper use of Tesla Technology (Star wars, HAARP and other military projects of USA and Former Soviet Union)

• The wrong space concept in contemporary physics (ignoring existence of the ether) – is a main problem leading to improper use of Tesla technology. Such use may lead to unpredictable consequences

• HAARP and other similar facilities for ionosphere heating experiments

• Chernobyl nuclear catastrophe – the analysis from a BSM-SG viewpoint leads to the conclusion that it has been an unthoughtful experiment for accessing energy from the ionosphere by improper use of Tesla technology

DANGER FROM EXPERIMENTING WITH IONOSPHERE

• **HAARP facilities in Alaska**. In 1990 one of the US senators defending the HAARP funding says: "We might be able to harness the energy in the aurora … In the senate he claimed: "It is the experiments that are going on trying to determine if it is possible to harness the energy of the electrojet…" (Nick Begich, ISBN 9780964881204)

• **HAAR facility <u>video</u> (youtube - public)**

• Preliminary experiments with beams to ionosphere show a **thousandfold power gain**, while the physics is not understood. From the BSM-SG vewpoint the excess energy comes from the Static ZPE while the ionized atmosphere helps to develop the HRM effect.

• In the former Soviet Union similar experiments have been tested before 1986. The **Chernobyl experimental facilities** might been used for this purpose.

• The **Chernobyl effect** has not been understood and it may happen by experimenting with HAARP and other powerful ionospheric "heaters"

•**Antigravitational effect** is apparent in the atmospheric nuclear tests. (The raise of the central column and the accompanied tornados). <u>video</u>

Relicts from the Soviet Union secret facilities in Ukraine (source: on-line publications in Russian)

• The experimental system Chernobyle-2, built in Ukraine from 1976 to 1979 and called a Center for Distant Radiocalls has been a super secret facility of the former SU.

• Part of the system, probably a specially design Tesla transmitter antennae, contained two concentric circles of 120 vibrators with a screen between them with a diameter about 300 m and height 10 m. The transmitter building in the centre consisted of 26 transmitters, each with a size of a 2 story house.

• Transmitter power: 8 MW pulse, 400 KW sinusoidal

• The transmitting facility is now disassembled but the land-mark is visible by Google Earth

• At distance of 2 km from the destroyed transmitter are still existing two vertical arrays of antenna with a height about 100 m, called Steel Giants. They are part of the over-horizon radar (pictures)


Landmark of transmitter

Analysis of the Chernobyl explosion from the on-line documents and the video "The true battle of Chernobyl uncensored"

• **An unique experiment** – documented in video

• **Purpose**: Attempt for power increase (from ionosphere?)

• **The explosion in the nuclear plant is sudden**

• The explosion is followed by a strong column of vertically expanded gazes, something quite different from Fukushima explosions. This is a **signature of an antigravitational effect**.

• The sudden release of energy and the antigravitational effect **could be a result of HRM effect** developed inside the reactor air volume

• **Hypothesis**: The longitudinal waves generated by powerful Tesla transmitters are able to bypass filters and power breaks and to form a close circuit, which includes: the the electrical system of the power plant (including the safety one), the antennae and the portion of the ionosphere. The ionized air inside the reactor (due to radioactivity) is suitable for development of HRM. Then the released ZPE energy from the ionosphere may be accompanied by ZPE energy released in the air volume of the nuclear reactor leading to sudden explosion.

• "**The True Battle of Chernobyl – Uncensored**": google video

Schematic explanation of the Chernobyl experiment causing the explosion:
HRM effect takes place in the Ionosphere and in the internal air space of reactor
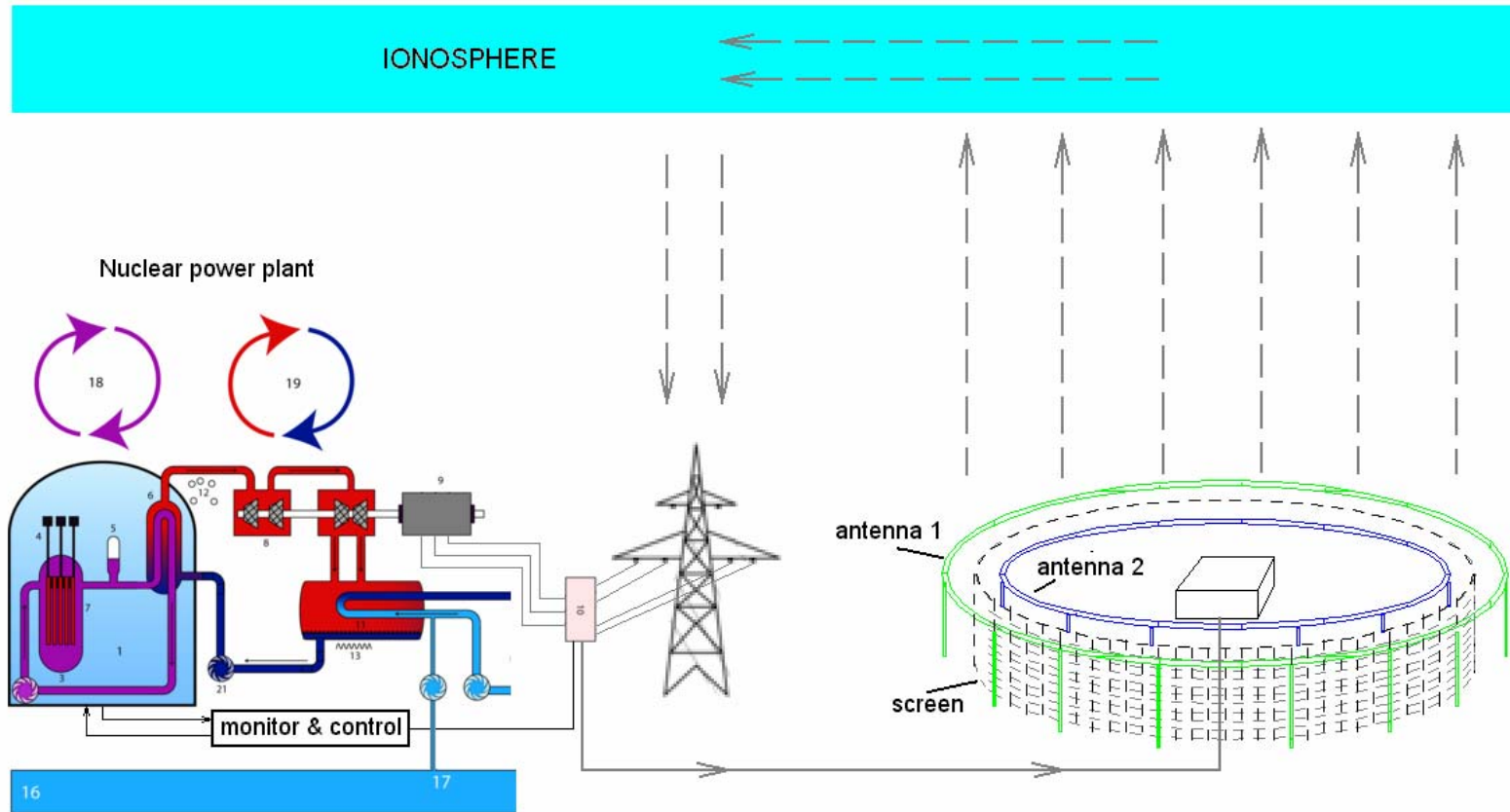
1. The HRM effect is accompanied by Longitudinal (scalar) waves (LW)
2. Main circuit of LWs: antennae – Ionosphere – power line - antenna supply
3. Secondary circuit of LWs: rector - monitor & control – reactor
4. The HRM effect in the reactor volume is induced by the HRM effect in the ionosphere due to the feedback from the LWs. The sudden explosion is caused by a fast release of zerpoint energy.

SUMMARY

• **The space (physical vacuum) contains two types of ZPE**: Static ZPE – a primary source of the nuclear energy related to the mass by the Einstein equation $E = mc^2$; Dynamic ZPE – smaller energy related to the existance and propagation of the Electrical and Magnetic fields

• **The enormous Static ZPE** was not envisioned by contemporary physics as a result of abandoned concept of Ether.

• **The static ZPE is directly accessible by nuclear reactions.** Strong nuclear reactions (fusion and fission) have radioactive byproducts. Week nuclear reactions (nuclear transmutations and many examples of cold fusion reactions do not have radioactive byproducts.

• **The Dynamic ZPE could be accessed by HRM.** In this case EM interactions are involved and there is no radioactive byproducts.

• **Playing with ionosphere is dangerous and unnecessary**

• **The nuclear energy from fission reactors is unsafe.** It accumulates an enormous amount of radioactive waste.

On line author's publications

- New approach for building of unified theory about the Universe and some results *arxiv*.org/pdf/physics/0205052

- *A New Physics with a Different Vision About the Universe and Our Origin* **http://vixra.org/abs/1105.0023**

- Basic Structures of Matter - Supergravitation Unified Theory Based on an Alternative Concept of the Physical Vacuum **http://vixra.org/abs/1104.0046**

- A Physical Model of the Electron According to the Basic Structures of Matter Hypothesis **http://vixra.org/abs/1104.0051**

- Theoretical and Experimental Research on Field Propulsion Using the Developments of the BSM-Supergravitation Unified Theory **http://vixra.org/abs/1105.0014**

- A Laboratory Experiment for Testing Space-Time Isotropy http://vixra.org/abs/1105.0030

- *Filed Propulsion by Control of Gravity. Theory and Experiments* **http://www.amazon.com/Field-Propulsion-Control-Gravity-Experiments/dp/144869308X**