The Program of the Decisive Experiment
to
the Project of New (Additional) $G\hbar/ck$ -Physics "Outside" the Light Cone

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The Standard Model/*SM* can be brought out of stagnation by implementing the Decisive Experiment Program for *the Project* of a New (Additional) $G\hbar/ck$ -Physics "Outside" the Light Cone, which substantiates the interaction of *dark matter* with *ordinary matter* (*SM*-technologies does not include *dark matter*/*dark energy*).

The Project was formulated based on annihilation anomalies positron (orthopositronium) in the system "β^+-decay of ^{22}Na – gaseous neon of natural isotopic composition (~ 9% ^{22}Ne)" observed in a cycle of experiments (USA, Russia, England, Canada**:** 1956-1965-1967-1975) and the result of critical experiment (Russia, 1987) of substantiate the paradoxical realization of the Mössbauer effect.

Keywords: new (additional) $G\hbar/ck$ -physics, Program of a decisive experiment, light cone, outside the light cone.

By the cycle of publications [1] identifies experimental grounds [2-8] and the phenomenology of the expansion of the Standard Model of Physics/*SM*, which has been in stagnation since the mid-1970s, - The *Project* of a New (Additional) $G\hbar/ck$ -Physics "Outside" the Light Cone.

A conceptual breakthrough to substantiate of the *supersymmetry*, *confinement*, *dark matter*/*dark energy* became possible in the *Project* due to a favorable set of circumstances. The history of this – "… *case – the God of all inventions*" – is presented in [12^{2017}].

For the world community of theoretical physicists, were determining the status of the *SM*, the experimental epic [2-7] and the critical experiment [8], leading to new knowledge, went unnoticed.

The program of a decisive experiment can change that state.

The main thing in the phenomenology under consideration [1] is the paradoxical realization of the Mössbauer effect in the final state β^+-decay ^{22}Na ("*resonance conditions*"). This occurs in process formation and annihilation of the positronium (β^+-*Ps*) in gaseous neon of the natural isotopic composition (~ 9% ^{22}Ne). The presence in the dynamics of orthopositronium (β^+-*o-Ps*) of a solitary virtual photon opens (with reliance on precedent in theory [9]) a fundamentally new '$G\hbar/ck$ -Physics' due to complete degeneration of ortho-para*super*positronium and possibility of β^+-*o-Ps* oscillations in "*Trough the Looking Glass*" (β^+-decay ^{22}Na as a *topological quantum transition*/*TQT*)

$$\begin{array}{ccc} \beta^+ - o - Ps & \Leftrightarrow & \beta^+ - p - Ps' \\ \downarrow & & \downarrow \\ \gamma^{\circ}(\cong 1.022\ \text{MeV}) & \Leftrightarrow & 2\gamma'(8.4\cdot 10^{-4}\ \text{eV}) \end{array} .$$

In this case, the canonical three-photon mode of *QED-o-Ps* annihilation (3γ; antidiscrete trivial topology) is realized in "resonance conditions" as the $\gamma^{\circ}2\gamma'$-mode "inside" (discrete implementation of the trivial topology in *TQT*; γ° is the *notoph* [10] and $2\gamma'$-mode "outside" of the Light Cone associated with it, where $\beta^+ - o - Ps$ from point of view of the *physical observer*/*PhO* appears as parapositronium/$\beta^+ - p - Ps'$).

Process

$$^{22}Na(3^+)\xrightarrow{e^+ + \nu}{}^{22*}Ne(2^+)\xrightarrow{\gamma(\cong 1.274\text{MeV})}{}^{22}Ne(0^+)$$

excludes, from the standpoint of the standard electroweak interaction, any noticeable effect of changes in the isotopic composition of neon on the output of the long-lived orthopositronium (*o-Ps*) component I_2 of the lifetime spectra (isotopic effect 10^{-7}-10^{-6}).

The experiment showed that I_2 doubled (1.85 ± 0.1) at a decrease in the fraction of the ^{22}Ne isotope in gaseous neon from 8,86% ("resonance conditions") to 4,91% [8].

The only way to justify this result is to postulate the formation in natural neon in final state of β^+-decay ^{22}Na of a macroscopic, space-like, two-valued ($\pm$) vacuum state, which implements the "resonance conditions" due to the solid-state nature of the *Hamiltonian graph* on the $N^{(3)} \cong 10^{19}$ nodes of $U^{\pm}$ (atom of long-range action/*ALRA* with a structured core of *ALRA* $\bar{n} \cong 5.3 \cdot 10^4$ nodes) and the collectivization of the nuclear excitation $^{22*}Ne(2^+)$ by the condensate $^{22}Ne(0^+)$ from the neon gas phase (~ 9% ^{22}Ne) on the core *ALRA* [11]

$$^{22}Na\,(3^+) \xrightarrow{e^+ + \nu + U^{\pm}} {}^{22*}Ne(2^+)$$
$$\gamma\,(\cong 1.274\text{MeV})\ 8.86\%\,{}^{22}Ne(0^+) \lrcorner\ .$$

Because of literary research, it was possible to reconcile all traditional experimental and logical installations under the assumption that β^+-*o-Ps* plays the role of the *PhO* (modeling of the *PhO* reflection) [1]. The apostasy of the Michigan experimental group (Ann Arbor, USA)/2003 and its overcoming were considered in [12].

Will be accepted the Project of the New (Additional) *Għ/ck* -Physics "Outside" the Light Cone, as an extension of the *SM*? Since the results of the fundamental experiments [2-7] and [8] were not given proper attention, the question is turned out to the Program of the Decisive Experiment.

Schemes of statements of decisive experiment.

1. Comparative observation of the lifetime spectra of positron annihilation from ^{22}Na β^+-decay by the method of delayed γ_n - γ_a-coincidences in gaseous neon of the natural isotopic composition high purity near normal temperature (~ 300 K) and of the gas temperature control in the range $\pm 10^{\circ}$.
   It is supposed to observe the temperature resonance: a high intensity of the orthopositronium component of the lifetime spectra (I_2) on the "tails" of the temperature range. With increasing distance from the pick of the temperature resonance, an increase in I_2 is assumed (up to 2 times) and, accordingly (after subtracting the contribution of the orthopositronium component), more clear visualization of the "shoulder" (annihilation of quasi-free positrons), i.e. normalization according to this criterion of the position of neon in a series of noble gases in the experiments of 1965-1975 (USA, Russia, England, Canada), in which the temperature of laboratories and samples was not recorded.
2. Comparative observation of the lifetime spectra of positron annihilation from ^{22}Na β^+-decay by the method of delayed γ_n - γ_a-coincidences in gaseous neon of the natural isotopic composition high purity at a temperature close to the "peak" (see item 1) in electric field of intensity ~ 4 kV/cm, oriented parallel and perpendicular to the gravity. It is necessary to keep the geometrical parameters of measuring chamber and the neon pressure close to the measurement conditions in the critical experiment [8]. The schema of this implementation of the decisive experiment is shown in Fig.1.

According to *QED* positronium, is the bound state of an electron and a positron, is a purely lepton state, free from any noticeable hadron effects and weak interaction effects, and its annihilation is calculated with high accuracy in *QED*. However, the *QED* standard may not be sufficient to describe the lifetime of the β^+ - *o* - *Ps*, since positrons forming positronium in substance are obtained from β^+-decay of ^{22}Na, ^{68}Ga, ^{64}Cu.

Work [8] confirmed the connection of the annihilation of β^+-*o-Ps* with hadronic processes.

In this connection, the data on the lifetime spectra of positron annihilation in liquid and solid deuterium (D_2) [13] and their comparison with similar data for protium (H_2) [14] are interesting. In work [13] measured the short-lived components of the lifetime spectra – $\tau_1 = 0.83 \pm 0.03$ ns (liquid D_2, 20,4 K) and $\tau_1 = 0.74 \pm 0.03$ ns (solid D_2, 13 K), but there is no data on the long-lived component (β^+-*o-Ps*); in H_2 $\tau_1 = 0.92 \pm 0.04$ ns (20,4 K), $\tau_1 = 0.80 \pm 0.03$ ns (13 K) and, unlike D_2, data on β^+-*o-Ps* are given ($\tau_2 = 28.6 \pm 2.3$ ns at 20,4 K and $\tau_2 = 14.6 \pm 1.2$ ns at 13 K).

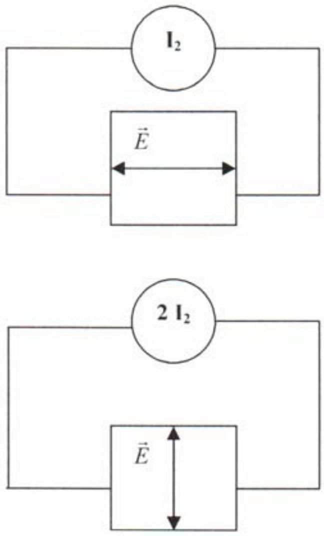

Fig.1. Scheme of the decisive experiment: is there a connection between the gravity and electricity?
I_2 is the intensity of the orthopositronium component of the positron (^{22}Na) annihilation lifetime spectra for neon of natural isotopic composition (~ 9% ^{22}Na – "resonance conditions") in a direct electric field of ~ 4 kV/cm, perpendicular to gravity.
$2I_2$ is the same in a direct electric field of ~ 4 kV/cm, parallel to gravity.

It is clear that in condensed deuterium β^+-*o-Ps* is formed in the same way as in condensed protium. The question remains: is the long-lived component β^+-*o-Ps* missing in the lifetime spectra of annihilation in condensed deuterium? The only work [13] does not give a definite answer to this question.

Nevertheless, it can be taken as a working hypothesis that the marked difference in the lifetime spectra of β^+-positron annihilation in the H_2 and D_2 condensed states is an experimental fact, since there was no precedent in the vast array of experimental information for the incomplete description of the lifetime spectra. Then, the absence of a long-lived component (β^+-*o-Ps*) in liquid and solid deuterium can be explained by quenching orthopositronium by uncompensated for electric charge and spin by radiolysis products in the blast-hole from a composite ion $[^4He\,e^-]^+$ with an initial energy of 23.85 MeV because of cold nuclear fusion on the *ALRA core*.

Hence the proposed scheme of the decisive experiment –

3. Comparative measurements of electrical breakdown thresholds in deuterium (D_2) and protium (H_2) of high density depending on the orientation of the constant electric field in the vicinity (~ 1 cm) of the positron source with respect to gravity ($\updownarrow, \leftrightarrow$).

Finally, a particularly important realization of a decisive experiment by the scientific community of the erroneousness of the apostasy of the Michigan group (2003), since under the leadership of Professor A.Rich (1939-1990) are created the only installations in the world for a precise absolute measurements of the lifetime β^+-*o-Ps* and β^+ - p - Ps' –

4. To make control measurements on the modified installation of the Michigan group (2003) by directing the auxiliary electric field not parallel (||), but perpendicular (—) to gravity.
5. **For direct confirmation of the connection of electroweak and strong interactions with gravity (phenomenology of the Theory of Everything), one should compare the lifetime spectra of annihilation of positrons (^{22}*Na*) in gaseous neon of natural composition obtained in the laboratory on the surface of the Earth and on the orbit of an artificial Earth satellite (in zero gravity) at the fixed normal temperature**.

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