

Fundamental Physical Properties of the Nature are Justified by Existence of Dark Matter: Simple Explanation of Antimatter Physical Essence

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Received: 10 December 2019; **Accepted:** 29 April 2020; **Published:** 26 May 2020

Abstract:

Existence of dark matter (DM), which fills all space and determines dynamics of Galaxies in the Universe, let explains fundamental physical properties of the Nature. It was shown by me in 4 recently published on-line papers in International Journal of Astronomy, Astrophysics and Space Science. First, observed properties of cosmic microwave background radiation (CMBR) at understanding that CMBR is produced by thermal DM motion, give materialistic substantiation to three conservation laws of classical physics and to all principles of quantum mechanics since mechanical action of DM thermal motion is equal to the value of Planck's constant. Secondly, understanding that creation of electron-positron pairs occurs from DM as two contrary rotating (according to their spins) material vortexes, gives substantiation of positron nature of ball lightning (a bunch of positrons), what explains all its specific properties. At that it was revealed that "electric field" of positron is an effect of positron rotation on nearest DM, what let substantiate a confluence of many positrons, which are concurrently next to created from all ambient DM at mighty streak lighting. Thirdly, such essence of "electric field" allows explain the reason of inexplicably many (some hundrets) registered short-living "particles" with their large masses and solve old puzzle of the absence of repulsion between protons in atomic nucleus (in small size of atomic nucleus there is not enough DM to produce "electric fields" of protons). Fourthly, DM existence gives materialistic explanation of some other fundamental properties of the Nature: a. Hubble's red shift without strange concept of the Universe expansion. b. physical essence of neutrinos as DM waves with different energy and zero rest mass. c. validity of Boltzmann's basing of statistical physics, and 4) failure of Michelson-like experiments at the Earth surface. In this paper on the base of DM existence is shown that established materialistic essence of "electric field" of "charged" particles let reveal simple physical essence of antimatter and indicates that behavior of "charged" particles (material vortexes) in DM (material medium) should obey the old known concepts of hydrodynamics of continuum media.

Keywords:

1. Introduction

The fact of existence in ambient space of dark matter (DM), which at its very low density ($\sim 10^{-29} \text{g/cm}^3$) explains observed dynamics of Galaxies since DM mass is ~ 10 times the mass of all visible cosmic baryonic matter, is now well accepted [1,2,3]. As clear, namely the properties of DM, which fills the real space, must determine physical properties of the space and, consequently, fundamental physical laws of the Nature. Recently, such important conclusion was confirmed by my in 4 successively published papers since 2014 year [4,5,7,8].

In the first paper [4], it is shown that observed properties of cosmic microwave background radiation (CMBR) at reasonable understanding, that CMBR is produced by thermal (at $\sim 2.7\text{K}$) DM motion, give materialistic substantiation to three conservation laws of classical physics and all principles of quantum mechanics. Thus, usually used conservation laws of momentum, angular momentum and energy are really true due to observed high homogeneity, isotropy and constancy of CMBR, correspondingly, and, consequently, that of the space filled by DM. Such required properties of the space for these conservation laws follow from mathematical theorems of E. Noether. As to quantum mechanics, a maximum wavelength of CMBR ($\sim 1.9 \cdot 10^{-3} \text{m}$) let calculate a mechanical action of DM thermal equilibrium motion [4], what is equal well to known value of Planck's constant, which is a mechanical action according to its physical essence. These results reveal materialistic base of used fundamental concepts both of classical and quantum physics, indicating their outcome from the properties of DM and confirming reality of DM existence.

In the second paper [5], taking in to account that well known creation of electron-positron pair occurs namely from DM as two contrarily rotating material vortexes (according to their spins), the substantiation of positron nature of mysterious ball lightning was given. Understanding that ball lightning appears as a bunch of big amount (up to 10^{17}) of positrons (at powerful streak lightning, when efficient creation of positrons are observed [6]) let first explain all observed specific properties of ball lightning. At substantiation of ball lightning positron nature important fundamental fact was revealed that "electric field" of positron is simply an effect on nearest DM by rotation of positron, which is stable material vortex (according to its spin).

Such physical essence of "electric field" (and "electric charge") of "charged" (rotating) elemental particles means that, if there will be not DM near these particles, they will be not able to have their "electric field" and hence not able to reveal their mutual repulsion. Namely this condition takes place in strong electric field of powerful streak lightning for many concurrently and next to created positrons from all nearest DM. In this case, such created positrons, being identical material vortex, may confluence with each other in one material vortex (a bunch of positrons), which should reveal in the air all known properties of ball lightning [5].

Revealed physical essence of "electric field" (and "electric charge") of "charged" (rotating) elemental particles also means that electron and positron (its antiparticle) are both created from the same DM but as contrarily rotating material vortexes (according to their opposite spins). The fact, that elemental particles are created from

DM only as pairs of contrarily rotating material vortexes, is a consequence of angular momentum conservation law, which should take place in the space uniformly filled by DM according to the result of the first paper [4]. As clear, namely this conservation law of the angular momentum provides known “charge” conservation law for “charged” (rotating) elemental particles, but only in the space, which is uniformly filled by DM. In the cases, when DM around “charged” (rotating) particles is absent (as at substantiation of positron nature of ball lightning), known “charge” conservation law should not hold true.

No doubt, it also take place for the case of created from DM another known pair of stable elemental particles in the Universe: normal proton and antiproton (its antiparticle). So, there is no specific antimatter in the Universe, but exists only DM, from which known stable elemental particles and their antiparticles are created as contrarily rotating material vortexes, which then produce all baryonic substance in the Universe: atoms, molecules and so on. As known, at collision of particle and its own antiparticle, an annihilation should occur (mutual confluence of opposite rotating material vortexes) with liberation in the DM space of the energy, which was spend on their creation. Thus, namely antiparticles are antimatter for normal elemental particles, both kinds of which are created from the same DM, but as contrarily rotating material vortexes. Consequently, there is no any specific antimatter in the Universe.

As was shown in the paper [7], revealed physical essence of “electric field” of “charged” (rotating) elemental particles let reasonably explain known problem of registered inexplicably many (more than 350) short-living particles, which do not obtain their full and clear classification. Only about 60 of these so-called “particles”, which are already considered as compound, have been classified in the frame of Standard Model, at that with the use of strange undetectable parameters (such as quarks, glue, color, flavor, and so on). As underlined [7], these short-living “particles” are always identified due to their tracks in the matter of used chambers, and they are never registered in free space filled by DM, where only stable elemental particles (electron, positron, proton and antiproton), hydrogen atoms and cosmic rays (neutrinos) with their very different energy are observed.

In the paper [7], it was also revealed the reason of calculated for some of short-living “particles” their peculiarly large masses, which are much larger than the masses of stable particles (electron, proton). These “charged” short-living “particles” are unstable since they are created from DM as material vortex, which rotate significantly slower than the stable elemental particles. Therefore, they produce (due to the effect on nearest DM of their slower rotation) significantly smaller “electric field” and, consequently, reveal significantly smaller “electric charge”, which should be significantly smaller, then that of for stable elemental particles. Therefore, at common calculation of their masses (from the curvature of their trajectories in magnetic field), the value obtained (at assumption that these short-living “particles” obey standard value of elemental “electric charge”) will be significantly larger than their real masses.

Besides, revealed physical essences of “electric field” (and “electric charge”) of “charged” elemental particles let give reasonable physical explanation to old puzzle of the absence of repulsion between protons in atomic nucleus [7]. As known, this puzzle obtained two hypothetic explanations: first by particle exchange theory (H. Yukawa, 1934) and then another explanation (called “asymptotic freedom”) by the theory of disappearance of repulsion between protons at their very close approach. However, both these explanations give no substantiation of the physical reason of this puzzle.

As shown [7], simple physical reason of this puzzle is that in very small size of atomic nucleus there is not enough DM (or not DM at all) to produce “electric field” of protons and, consequently, cause their repulsion.

In the last mentioned papers [8], it is stated that taking into account the existence of DM let also give reasonable materialistic explanation to some other observed fundamental physical properties of the Nature.

First, the existence of DM reasonably explains an observed Hubble’s red shift by the loss of the energy of electromagnetic waves (waves of DM) at their travelling in the substance of DM. This energy loss, which should lead to red shift in spectral lines of electromagnetic waves, must be larger for the waves coming from more distant cosmic objects, as it is really observed. Such explanation corresponds to known concept of so-called “tired light” and reveals the reason of Hubble’s red shift without using of incorrect concept of Universe expansion, which is based on Doppler’s effect and lead to unaccountable concept of “dark energy”. Incorrect concept of Universe expansion also does not corresponds to observed stationary state of the Universe, what was confirmed by Plank-2013 satellite mission.

Also the existence of DM let give simple materialistic explanation of physical essence of all known different kinds of neutrino as DM waves, which have their very different energy. So, as clear, all neutrino are not particles and should have zero rest mass, what is entirely like to the known case of “photon”. Neutrino, as DM waves, may freely propagate through any material bodies (e.g. through the Earth) since all bodies are saturated with DM and since neutrino (DM waves) weakly interact with particles of matter because of very small cross sections of this interaction. However, high-energy cosmic neutrino (wave of DM) may occasionally (with very small probability) interact with some particles of matter. At that, the energy of such neutrino should create many scattered secondary energetic “particles”, which may produce observed different tracks in the matter of the chamber as it is noted in [7].

As underlined in [8], it is very important for physics as a science, that the existence of DM unambiguously confirms the validity of Boltzmann’s approach developed by him for substantiation of applicability of statistical physics methods for description of many-particle physical processes. It is so, since DM exhibits equilibrium thermal (at 2.7K) motion, hence the motion of any bodies in DM substance should undergo to random walk like the well known case of Brownian motion. So, a motion of any material bodies in DM substance is chaotic, in principle, what is the base of the Boltzmann’s approach.

As also was shown in [8], the existence of DM explains the reason of known failure of Michelson-like experiments, which were carried out at the Earth surface for searching the existence of the ether in the space (the ether is the same as DM). The reason of the failure is that the layer of DM, which is near the Earth surface, must be almost motionless relative to the Earth surface due to gravitational interaction of DM with the Earth. This is like to known case of a body moving through gas or liquid substance, when some layer of this substance (near the body surface) always moves together with the body. Consequently, Michelson-like experiments, carried out at the Earth surface, were not able to reveal the motion of the ether (DM) relative to the Earth. As clear, such experiments should be carried out far enough from the Earth surface. The motion of the Earth through DM (and hence the fact of DM existence) is confirmed by observed (from the Earth) weak ($\sim 0.1\%$) dipole anisotropy of CMBR,

what shows that the Earth (together with the Solar system) moves through DM in the direction to the Leo constellation with the rate ~ 400 km/s.

Thus, mentioned results of 4 published my papers [4,5,7,8] show that understanding of DM existence let give materialistic explanation for all known fundamental laws of physics and for several important physical properties of the Nature. Besides, at substantiation of positron nature of ball lightning [5] on the base of DM existence a materialistic essence of “electric field” (and “electric charge”) of usual stable “charged” particles (positron, electron) was revealed [7]. These “charged” particles should be considered as rotating material vortexes (according to their spins), which “electric field” is the result of their rotation, leading to rotation of nearest DM.

Such understanding means that all “electrical” phenomenon (including “electric” and “magnetic” fields) may receive their materialistic description on the base of well known concepts of hydrodynamics of continuous medium (the space filled by DM). This conclusion is confirmed by recent theoretical calculation of mutual interaction of two material vortexes in material medium (fluid) with the use of the concepts of hydrodynamics [9]. As obtained [9], equally rotating material vortexes show mutual repulsion, but contrarily rotating material vortexes show mutual attraction, what, as clear, is just the same as known for the behavior of differently “charged” (differently rotating) known elemental particles (electron, proton and their antiparticles).

In this paper it is shown that understanding of DM existence, what let explain fundamental physical properties of the Nature, also let reveal physical essence of the concept of antimatter and reasonably solve known problem of baryonic asymmetry in the Universe. Used approach first takes into account the fact that creation of pairs particle-antiparticle occurs from DM as two contrarily rotating material vortexes (according to their spins). Then it takes into account revealed physical essence of “electric field” of stable “charged” (rotating) elemental particles (electron, positron, proton and antiproton) as effect of their rotation on nearest DM.

2. Existence of DM Let Reveal Simple Physical Essence of Antimatter

As known [10], used concept of the essence of antimatter states that antimatter consists from antiparticles (positrons and antiprotons) and must annihilate with equal mass (m) of normal matter at their collision in the space. At that, an appearance in the space of the energy (E) takes place, which value corresponds to well known relation $E=mc^2$, where c is the speed of electromagnetic waves in the space.

As also known and underlined in papers [4,5,7,8], creation of all stable elemental particles (electron, positron, proton and antiproton) in the Nature occurs from DM as pairs of two contrarily rotating material vortexes, which are a particle and its antiparticle. This is in accord with angular momentum conservation law, which should be always fulfilled in the space uniformly filled by DM as shown in [4]. As also known, for creation of each pair of particle-antiparticle some value of the energy E (usually from the energy of electromagnetic wave quantum) should be spend, which should be equal to $E=mc^2$, where m is the mass of particle (and antiparticle). As also well known, namely a collision in the space of particle and its own antiparticle leads to their mutual annihilation (a reverse process of their creation), what displays to the space (in the form of electromagnetic waves) the energy value $E=mc^2$, which was once spend on their creation.

As shown in [5] at substantiation of ball lightning positron nature, such processes of creation of electron-positron pairs in powerful streak lightning, leading to confluence of this positrons in antimatter bunch (positron ball lightning), and then gradual annihilation of ball lightning positrons with electrons of air molecules at their collision with ball lightning take place in the air.

So, as clear, namely each antiparticle, which is an opposite rotating (relative to the normal particle) material vortex from DM, should be considered as antimatter to their own particle in accord with supposed antimatter properties.

Thus, as clear, there is no specific antimatter in the Nature, but exist only (both created from DM) normal particles and their antiparticles (opposite rotating material vortexes), which are antimatter relative to their own normal particles.

3. Conclusions

Existence of DM, which fills all space, and reasonable understanding that observed CMBR is produced by thermal (at 2.7K) DM motion, gives materialistic substantiation of three conservation laws of classical physics and all principles of quantum mechanics since mechanical action of DM thermal motion is equal to known value of Planck's constant [4].

Comprehension that known creation of electron-positron pairs occurs namely from DM as two contrarily rotating material vortexes (according to their spins) let reveal positron nature of mysterious ball lightning, what first explains all its specific properties [5].

At given substantiation of ball lightning positron nature, a fundamentally important result was established that "electric field" of positron is simply an effect of positron (material vortex) rotation on nearest DM [5,12]. This conclusion was confirmed recently by calculation of mutual interaction of two material vortexes (equally or contrarily rotating) in material medium with the use the concepts of hydrodynamics [9], what shows their interaction like for "charged" particles.

Revealed [5,7] simple physical essence of "electric field" (and "electric charge") of "charged" (rotating) elemental particles means that electron and positron (its antiparticle) are both created from the same DM. The same is true for creation from DM another pair of stable elemental particles: proton and antiproton (its antiparticle), which should annihilate (as electron and positron) at their collision.

Thus, each antiparticle, which is an opposite rotating (relative to the normal particle) material vortex, should be considered as antimatter. So, there is no specific antimatter in the Nature, but exist only (both created from DM) normal particles and their antiparticles, which are antimatter relative to their own normal particles.

As was shown in my 4 published papers [4,5,7,8], understanding of DM existence gives materialistic explanation to many of the most fundamental physical properties of the Nature, what, no doubt, confirm the reality of DM existence.

As important conclusion from DM existence it should be underlined that revealed physical essence of "electric field" (and "electric charge") of stable (rotating) elemental particles (as a result of effect on nearest DM by their rotation) signify the appearance of materialistic conceptions about existent physical processes in the Nature.

This circumstance let create in future New Physics, were “electrical” phenomenon (including “electric” and “magnetic” fields) will receive their materialistic (on the base of DM existence) description, what will allow create unified system of measuring of all physical quantities.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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