Baryongenesis until dark matter: H-particles proliferation

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Abstract

This paper is a digression on the dark matter and dark energy considering the baryongenesis and their evolution until the actual Universe. The factors of inflation and matter-energy are analyzed, likewise the hadrons as fundamental part in the dark matter production. Some results on torsion in baryongenesis are used to complete the evidences as Baryon acoustic oscillations, the effects due to the cosmic expansion, redshift, space distortions, etcetera.

1. Introduction

The current model of our Universe given by CMB[1], consider the nucleosynthesis as the fundamental process as former of the energy-matter in a long process passing for the leptogenesis and baryongenesis in the Early Universe. In a sometime, the Universe was conformed by the proliferation of leptons, which conformed charges in the Universe. This, in the process of the matter due to the actuation of torsion field [1-3] produce the gravitational field. Then, this conforms an Universe very seemed to the actual Universe with high proliferation of atoms with the extra energy evidenced for the neutrinos and free photons observed for example, in the luminous disk of a galaxy horizon until 10 kpc [2] (see the figure 1). But this indicium is not precise accord with the inhomogeneity detected by the WMAP (redshift-space distortions and microwaves in background) observations in the background of the actual Universe [4]. Precisely, we could consider an extension of the standard model, but what happen with the gravity failure in these cosmic inhomogeneity effects [5]? Well, in it is necessary consider additional studies on torsion evidence extrapolate to the baryongenesis evolution to prove that the cosmic inhomogeneity effects are due the torsion field in a microscopic level of observation [6], for example, in the baryon oscillations inside cosmic expansion (see the figure 2).

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[1]Cosmic Microwave Background.
[2]kpc = Kilo-Parsec (astronomical distance unit).

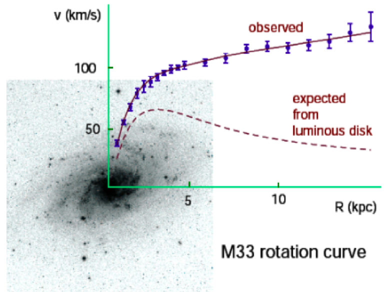


Figure 1: Cosmic expansion in dark matter.

Then possibly will be very useful some aspects of the general relativity and quantum field theory focused to fit with the CMB-model and the supersymmetrical extensions that must be considered in the standard model to action fields [7, 8].

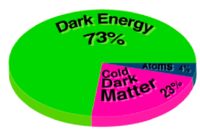


Figure 2: Cosmic expansion in dark matter.

2. Dark matter and torsionful gravity

In the studies of the dark matter have arisen certain questions wanting establish the origin of this. One question is given around gravity, which says: physically the dark matter is a manifestation of gravity or matter-energy?

Remember that we concluded [9] that the torsion field stay univocally determined through $\mathbf{H}-$ fields considering the established ranges and the Dark matter begins their action on the fermionic dispersion to produce gravity annulling the chirality of the neutrinos/anti-neutrinos interaction and becoming these in oscillations of gravitons or "gravitational waves" registered and measured through spinor frames of the Majorana states [10,11].

Then through this mechanism could be explained the dark matter as vacuum energy with a magnitude. Of fact could use the scalar field theory and the Majorana states registered in fermionic process.

How could be the observation of dark energy affected for inhomogeneity?

The mechanism begins with the right-handed Neutrinos whose inherence meets with the detected in the CMB-model, This could suppose that the gravity involves an inner scattering which can be provoked for the rests of the nucleo-synthesis in the early baryongenesis process with certain anomalies due to the energy density present in that step of gravitational evolution of the space-time.

In other paper [12], the WMAP exploring gives certain data disfavor strongly on the hot dark matter (Neutrinos) having that the energy density of the Universe comply with $\Omega_\nu h^2 < 0.0076$ corresponding to state $m_e < 0.23eV$. In the case of the warm dark matter (gravitino) is disfavored by the evidence to re-ionization at redshift $z \cong 20$.

Then the inhomogeneity can be explained for the torsion effects always and when to the cold dark matter remains axions, super-symmetric dark matter (lightest SUSY particle (LPS)) and permanence super-heavy particles masses of the order $\cong 10^{14\pm5}GeV$.

Figure 3: Dark matter evidence in the Observable Universe. This sidereal object is a galaxy group in the Major Can constellation. The lightening due the high concentration of sterile Neutrinos.

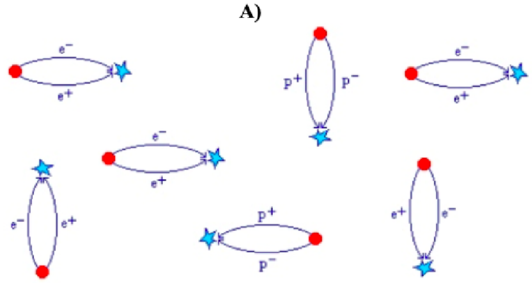
But this can be detected considering from the CDM (Cold Dark Matter), the average energy density $\Omega_{CDM}h^2 < 0.112 \pm 0.006$. Then the dark matter is extended to the standard model with the cold dark matter remains. But this in gravity is the torsion existence until levels where torsionful gravity explains the microscopic inhomogeneity of the space-time (see the figure 4).

The indicium of the inhomogeneity considering the before discussion is measurement of baryon acoustic peak in local Universe (see the figure 5). Here was used the 6-degree Field Galaxy Redshift Survey where relative inflationary value is $H_0 = 67.0 \pm 3, 2kms^{-1}Mpc$.

3. Dark energy

The cosmic expansion is equivalent to the baryon oscillations, which produce the dark energy. This fact can be gauged considering an appropriate w- parameter inside the field equations in the framework of the scalar field theory having in count certain values of w, to different physics character-

A)



B)

Figure 4: A). Microscopic inhomogeneity of the space-time [13]. B). Torsion mechanism from the baryons evolution [6, 10]. To inhomogeneity from a point of view of gravity, we require the higher dimensional theories, as example superstring theories.

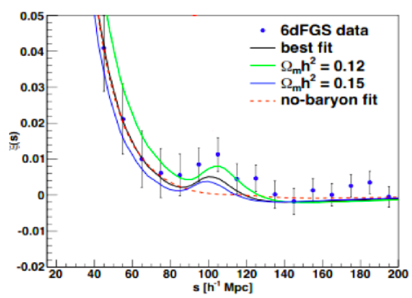


Figure 5: The 6-degree Field Galaxy Redshift Survey. In the graph is showed an inconsistent defined in the range $\Omega_{CDM}h^2 < 0.112 \pm 0.006$.

istics or different key values [3]. For example the values $w = 0$, to matter,

[3]Using baryon acoustic oscillations, it is possible to investigate the effect of dark energy in the history of the Universe, and constrain parameters of the equation of state of dark energy.

$w = 1/3$, to radiation, $w = -1$, as cosmological constant and $w < -1/3$, to accelerating fluids in the Universe.

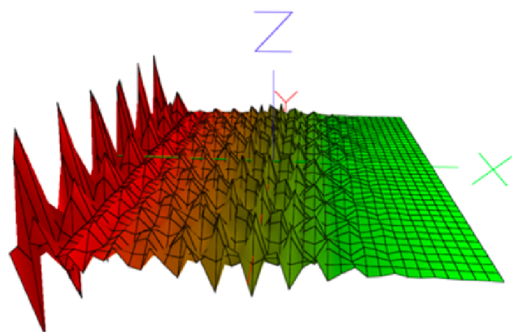


Figure 6: Geometrical model created by [11] to explain the persistency of torsion field in the production of the gravitational waves. The dark energy could be the remains axions in the expansion process. Possibly a key value that can arise in the field equations. Observe the horizon of the 2-dimensional space model and compare with the 6-degree Field Galaxy Redshift Survey given in the figure 5. The inconsistency could arise of the second process or baryongenesis, where dark energy begin in the Universe joined with gravity. This explains the appearing of matter to starting of the nucleon-genesis process [14].

The before values are considered as characters of the corresponding work that is required in each physical entity (matter, radiation,. . .) considering the latent force of certain "pressure" (tug) of the physical entity contrary to the displacement of certain heavy particle. These values are theoretical and are obtained through dynamical models where is applied the virial energy model of the Universe. Then could be that the dark energy had a negative pressure, contrary to the dark matter, which had a positive pressure. Finally, the variations of the pressure in both physical aspects; dark matter and energy can be detected along the Universe expansion process as baryon oscillations, considering the experiments with heavy particles. Then dark energy is a gravitational + photon energy that full all the space and interacts with the matter producing field effects from these bodies which are observed as maser and laser radiation. Of fact in this step of the Universe is given a proliferation of

H-particles[4], which explains the major quantity of hydrogen in the Universe, as fundamental chemical element to the composing of the interstellar and sidereal bodies (stars, star globular, nebulas, galaxies. . .).

[4] Hydrogen atoms.

TABLE I
PHYSICS OF DARK ENERGY WITH W-PARAMETER AND SCALAR FACTOR a.

#	Physics	Equation
1	State (Radiation, temperature, scattering)	$P = w\rho$
2	Conservation of Energy	$dE = d(\rho a^3) = -pd(a^3)$
3	Re-arranging	$\rho \propto a^{-3(1+w)}$
4	Friedmann equation (thermal inflation, expansion, matter variation)	$da/dt \propto a^{-(1+3w)/2}$

4. Baryon oscillations and proliferation of H-particle sources in dark energy

The dark energy is in reality the behind of the gravitational and electromagnetic energy in the Universe in the microscopic fundamental levels and the application of the Einstein field equations can be useful until certain level, on all in the explanations of the state and thermal phenomena of the Universe. But no explains the gravity energy and the inconsistencies in the inflation behavior of the Universe comparing the poor existence matter in the space-time and their expansion of himself. Also the forming of the H-particles in the Universe, their proliferation necessity and interacting with the photon sources extended these in the widest vacuum regions of the Universe. To this is necessary first recognize the step or moment in the Universe evolution where is given the proliferation of the H-particles after of the Baryongenesis (in a short time after this Nuclogenesis) [7].

Then arises the matter, but in the initial state with the interaction of wide photon sources extended in the Universe beyond of the de Sitter Universe.

Theorem 4. 1. (F. Bulnes). The dark energy is given beyond of the fundamental interacting of the Baryongenesis and arises with the proliferation of the H-particles in extended photon sources.

Proof. If the dark energy happens beyond of the Baryongenesis then in a photon horizon, with the interaction with the first hydrogenic atoms are produced the instabilities which can be indirectly detected or measured for the variation produced to $\Omega_{CDM}h^2$ (see the figure 5).

This can be proved since CDM are axions, that play an important role to the inhomogeneity [7, 8]. This inhomogeneity, which can be, explained for the torsion effects and the super-symmetric dark matter (lightest SUSY particle (LPS)) permanencies as super-heavy particles masses of the order $\cong 10^{14\pm5}GeV$, which produce a hydrogenic particle scale, whose field has effective sources for emission and absorption of H-particles and photons. However, not explains the high radiation that can be produced of the inhomogeneity.

However, the initial description of H-particles when is assumed their stability only is true when is considered a very short scale time interval. The two particles, H-particle and photon are recombining to shape a single H-particle. Thus, a description of the coupling between weak, causally arranged H-particle sources that does not refer to the real existence of two or more particles propagating between them is physically incomplete.

Then this argumentation does to suppose that this "incompleteness" produce an instability, which provokes high radiation, that comes from the H-fields, and which are hydrogenic particles in a next short time interval, which come from the Baryongenesis. Indeed, of Baryon acoustic oscillations or maser are the consequences of consider the interaction between H-particles and photons along of a large time interval in the process. But, this carries a proliferation of H-particles in extended photon sources, where these last sources are themself resulted of the set of heavy charged particles of photons where their residuals are hadrons (strong interactions of hadrons emerging as residuals) whose forces are stronger magnetic forces. This last to explain in the macroscopic level the existence of magnetic intersidereal fields, as is the case, for example in the galaxies that are extended until the decaying of the dark energy in the limits of the proper sidereal object (see the figure 7). These sidereal matter bodies and all the other bodies are enveloped by the energy of this proliferation of H-particles in the extended photon sources. $\diamond$.

The before arguments used in the demonstration of the theorem 4. 1., can be enforced considering the radiation gauge that substitute the metric tensor $g^{\mu\nu}$, given for the sum $\sum_{\lambda} e^{\mu}_{k\lambda} {e^{\nu}_{k\lambda}}^*$, which could have a consistency of dark energy that comes from the strong interacting of hadrons, where each residual given along a λ, can be expressed as transverse parts of multiplying currents

$$J = i\int (d\xi)(d\xi')J^{\mu}_1(\xi)D_+(\xi - \xi')J_{2\mu}(\xi'), \tag{1}$$

then

$$\sum_{\lambda} e^{\mu}_{k\lambda} {e^{\nu}_{k\lambda}}^* = 1 - \frac{\mathbf{kk}}{(k^0)^2}, \tag{2}$$

when these multiplying currents are the unit then begins the matter energy and thus the gravitational fields in their early state as hydrogenic particles.

If we consider the unit 1, as the Universe extended to infinitum then all amplitude of the extended photon sources immerse of the Universe must satisfy to their fields that:

$$\langle 0_+ \mid 0_- \rangle^{JK} = 1 + i\int (d\xi)(d\xi')J^{\mu}_1(\xi)D_+(\xi - \xi')J_{2\mu}(\xi')\times$$

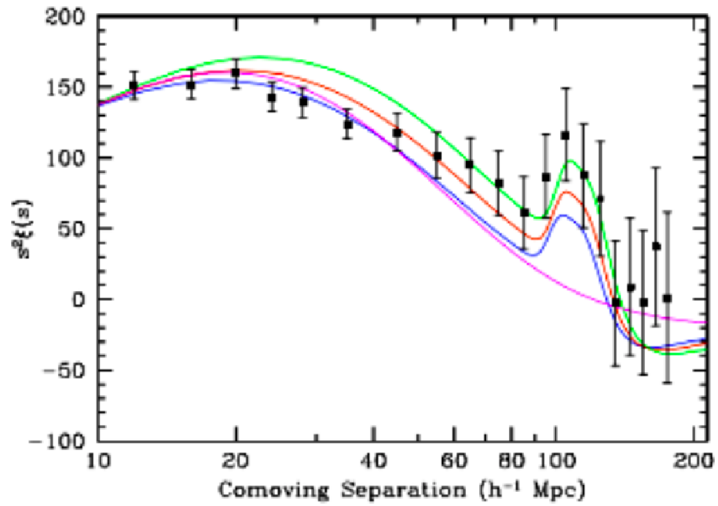


Figure 7: Magnetic intersidereal field decaying in the limits of the proper galactic horizon. Observe how the perturbation is evident when are considered proliferation of the H-particles in the extended photon sources.

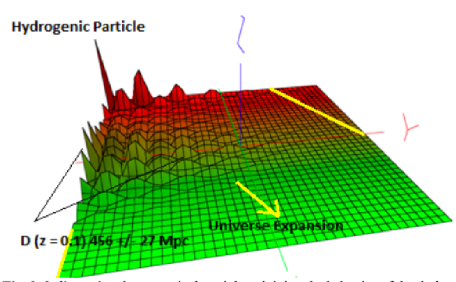


Figure 8: 2-dimensional geometrical model explaining the behavior of the dark matter and dark energy in the Universe expansion. The gravitational field indicium are the early gravitational waves, which until our days are detected [8].

$$i \int (d\chi)(d\chi')K_1(\chi)\Delta_+(\chi - \chi')K_2(\chi') + ... \tag{3}$$

where has been used the mathematical property of the mutual actions of two particles [15], where one is an H-particle and the other a photon. These processes multiplies at infinitum.

5. Experiments

Now in our days the experiments reveal strong interactions between hadrons and mesons, which reveals presence of dark matter particles, but not necessarily physics as is suggested in the theorem 4. 1. Then arise indirect detections, excess of gamma ray annihilation products seen in the center of our galaxy, although this is pure speculation and could have other function that not is the dark matter production or some physics relative of the interactions in this site, for example gravitational energy as waves.

In the Large Hadron Collider, should be produced an abundance of dark matter due to the principal idea of collider the Hydrogenic particles with UV light (see the figure 9). These products can be, for the theorem 4.1, the supermassive particles or WIMPS, considering the corresponding step analyzed in the theorem 4. 1, and that come from of the dark energy, such as is mentioned.

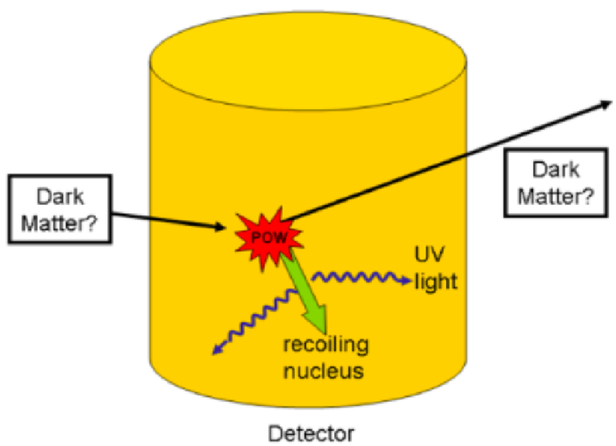


Figure 9: Fundamental scheme of the Hadrons collider (see the figure 11).

Then WIMPs can be detected directly, indirectly or at colliders, within the grasp of current experiments, that is to say, residuals as the transverse currents components given in (1).

The limitations of experiments are remitted for the high interaction of energy and abundance of sterile Neutrinos. However, a good study on super-symmetric extensions to the standard model of particle physics could provide a good theoretical framework on the base of the excess gamma rays. Although in particle physics, this could have a connotation on the lightest super-symmetric particle (LSP) which are additional hypothetical particles found in super-symmetric models.

In models with R-parity conservation, the LSP is stable; in other words, the LSP cannot decay into any Standard Model particle, since all SM particles have the opposite R-parity [19]. There is extensive observational

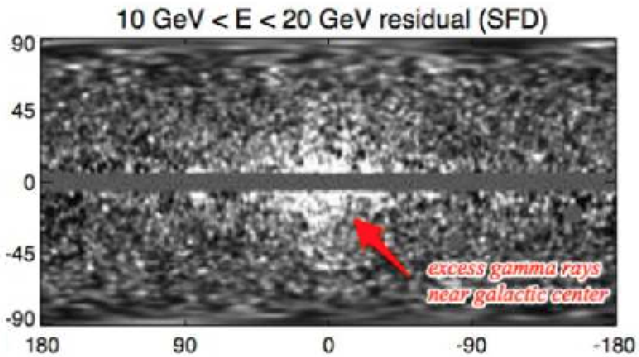


Figure 10: Physics evidence of the excess gamma rays near galactic center, which suggest the dark matter formation [18].

evidence for an additional component of the matter density in the Universe that can be the dark matter.

Finally, the perspective in this study that comes from an extension of the standard model, is projected on the necessity to reproduce observed oscillations from the right-handed Majorana neutrinos [16]. Then the oscillations can be represented by Dirac equations, whose solutions are the planted by the Bianchi cosmologies, that is to say gravitation on supersymmetries.

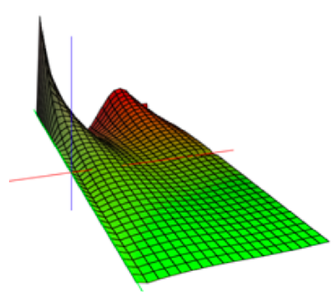


Figure 11: 2-Dimensional model of inconsistency given in the red region for the proliferation of H-particles along of the large interval (recoiling nucleous) (see the figure 9) [15, 17].

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