

Verification of Al-Amr Theory Constants Using N-Test Results from Planck 2018 and Analysis of 1700 Supernovae Data from the Pantheon+ Catalog

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Abstract: In this paper, the constants of Al-Amr theory were verified based on the analysis of N-Test experiment from Planck 2018, and data of 1700 supernovae from the Pantheon+ catalog. The observations - within accuracy limits - have come in support of the validity of Al-Amr theory.

Keywords: Al-Amr Theory, Ibrahim Constant, N-Test, Planck 2018, Pantheon+, Cosmological Constant, Ibrahim Number.

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I. INTRODUCTION

Quantum cosmology seeks to understand our universe on the basis and principles of quantum theory in addition to the general theory of relativity GR, it tries to answer important questions about our cosmic universe, especially those related to its beginning, its end, and its fate.

Classical Cosmology depends entirely on the general theory of relativity of Albert Einstein which describes the evolution of the macroscopic universe under the influence of gravitational force with deterministic properties.

This description of the universe is considered an incomplete and deficient description, as it did not take into account quantum theory which describes the other half face of our universe, the microscopic half, which includes quantum forces with statistical properties.

Therefore, there was an urgent necessity to merge the two important theories together into a unified theory of forces in order to draw the full picture with its complete face.

Some attempts have appeared in order to reach this goal, such as: string theory, and the loop quantum gravity theory LQG, and finally came Al-Amr theory [1] to laid down the correct rules required to build quantum cosmology, where it predicted the transition of our universe to another universe at its near end, by rotating across a barzakh "a non- spacetime isthmus", as then occurs for it a phase transition or a time inversion[2].

We can use this understanding to correct our knowledge about "black holes", where a black hole can be understood as a "non- spacetime isthmus" or a non- spacetime gap that separates between the edges of two opposite spacetimes, it is a passage from one spacetime to another opposite spacetime, where the curvature reaches a specific limiting value at the edge of spacetime.

Accordingly, understanding the effect of the black hole according to our theory will be as follows: "When something in our macroscopic universe (a star, for example) reaches the edge of its "private spacetime", where the curvature has reached a limiting value there, it suddenly moves by rotating across an isthmus, a non-spacetime gap, to another opposite spacetime after its "disintegration and decay", and it completely disappears from our universe.

The direction of the other spacetime is opposite to the direction of the first one. The first transforms from height to bottom, and the other transforms from bottom to height.

Al-Amr theory accepts experimental testing in the domain of low energies without any need to conduct high-energy experiments, as the principle of Al-Amr: $v \cdot r = C$, has been practically verified, and Ibrahim universal constant C has been found [3].

The letter v represents the momentum per unit mass and is written as: $v = \frac{m}{m_c} c$,

Where:

$$(N^{-1}m_c) \leq m \leq m_c$$

Current quantum gravity theories – strings , LQG - suffer from difficulties and obstacles in experimental testing because they operate at Planck scale.

This research aims to verify the constants of Al-Amr theory based on data analysis of the N-Test experiment from Planck 2018, and analysis of data of 1700 supernovae from Pantheon+ catalog.

In the N-Test experiment, the values R_{obs} and M_{obs} for the universe are taken from Planck 2018, and m_{cr_c} is calculated and the result is compared with the values of elementary particles[4].

As for when analyzing data of 1700 supernovae from Pantheon+ catalog[5], it is proven that the ratio $(\rho_{cr_c})/\rho^v = N^2 = \llbracket 10 \rrbracket^{122}$ becomes 1 after correction[6], and that Λ is a universal constant that does not change with redshift z .

II. CONTINUOUS CREATION, AND QUANTIZED SPIN

In the stage of "creation" of the created-built universe model, the spacetime of our microscopic universe is directed from bottom to height ,while in the stage of "building" the spacetime of our macroscopic universe is directed from height to bottom:

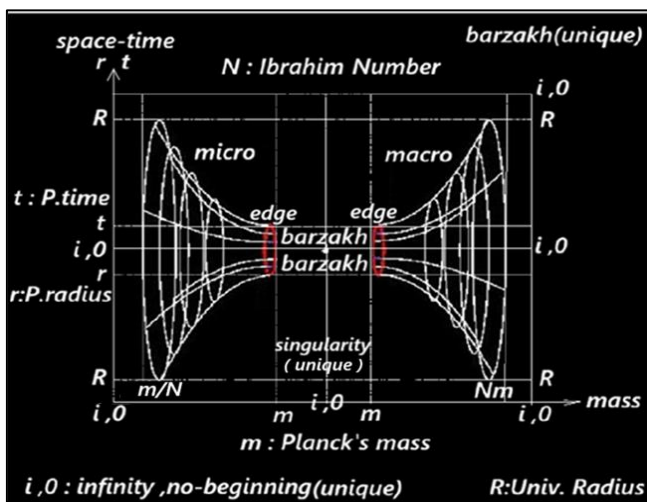


Fig 1 The "Created – Built" Universe Model

The isthmus is a non-spacetime gap that separates between the edges of two opposite spacetimes .The spacetime singularity exists in the non-spacetime isthmus, and the singularity is at the non-beginning with respect to beginnings of spacetimes, and at the infinity with respect to ends of spacetimes.The singularity, or "non-beginning and infinity" is a single unique place in existence, it is the same spacetime , not two spacetimes , it is beyond our universe ,separate from it, it is the highest spacetime in existence at all (absolute height), as no spacetime higher than it can be imagined in mind[1].

In the spacetime of our microscopic universe, the mass of the particle continuously increases in its acceleration from bottom to height until reaches the Planck mass m_c , and its acceleration reaches the maximal universal acceleration a_c , that is at the edge of spacetime and its end, where the curvature has reached a specific limiting value ,the maximal universal curvature R_c .The particle is then emitted from the edge of the microscopic spacetime and suddenly enters into the spacetime of our macroscopic universe by rotating across the barzakh(a non-spacetime isthmus), where a phase transition or time inversion occurs for its "private spacetime" by this rotation to be compatible with the spacetime of our macroscopic universe directed from height to bottom.

In this phase transition or rotation, a quantized spin arises for it, the particle enters with this intrinsic property into our macroscopic universe, hence the magnetic property is generated for it.

Thus, particles enter from our microscopic universe into our macroscopic universe separately, one after another, where this creation process continues at a rate of one mass unit m_c per time unit t_c , i.e. that the creation rate κ in our macroscopic universe is a constant, equal to:

$$\kappa = \frac{m_c}{t_c} \quad (1)$$

Our macroscopic universe reaches its total mass M :

$$M = Nm_c \quad (2)$$

During its age period T :

$$T = Nt_c \quad (3)$$

Its radius R will be:

$$R = Nr_c \quad (4)$$

Where: $= 10^{61}$, is Ibrahim number

According to the "Big Bang theory", the mass of the universe M is constant and does not change.

III. THE UNIVERSAL CONSTANTS IN AL-AMR THEORY

- Ibrahim constant C
- Maximal universal number (the cosmic quantum number N)
- Fundamental charge q_c
- Magnetic moment of Al-Amr μ_c
- Maximal universal curvature R_c
- Length density of our macroscopic universe λ
- "Moment of Inertia per unit length" of the elementary particle D
- Creation rate of matter in the macroscopic universe κ
- Fundamental unification energy $E_c = \kappa C$

The fundamental charge q_c is equal to the elementary charge e divided by the square root of the fine-structure constant α :

$$q_c = \frac{e}{\sqrt{\alpha}} \quad (5)$$

The electromagnetic properties of Al-Amr constant C appear in the relation:

$$C = \mu_c / q_c \quad (6)$$

The maximal universal curvature R_c is very large but limited, not an "infinite" value as claimed by the Big Bang theory.

Our cosmic universe is "one-dimensional space" with two absolute opposite directions: height and bottom, while the other directions are relative.

The cosmological principle states that "the universe is homogeneous and isotropic in space time."

The inverse of the length density r/m is the most important constant to calculate. Then for macroscopic universe, we write Ibrahim function $r = r(m)$ in its exponential form, as:

$$r = \frac{m}{\lambda} \exp\left(\frac{m}{m_{a_n}} - 1\right); m_{a_1} \leq m \leq m_{a_N} \quad (7)$$

$$\text{WHEN: } m = m_{a_n}, \text{ then } r = r_{a_n} = \frac{m_{a_n}}{\lambda}; n = 1.2.3 \dots N$$

$$\text{if: } n = 1. \text{ then: } m_{a_1} = m_c, r_{a_1} = r_c, r_c = \frac{m_c}{\lambda}, \text{ i.e. } \frac{r_c}{m_c} = \frac{1}{\lambda}$$

$$\text{if: } n = N. \text{ then: } m_{a_N} = Nm_c = M, r_{a_N} = Nr_c = R, \text{ i.e. } R = \frac{M}{\lambda},$$

Then, we write the "equilibrium condition of macroscopic universe", as:

$$\frac{r}{m} = \frac{1}{\lambda}; m_c \leq m \leq Nm_c \quad (8)$$

$$\text{When: } m = m_{a_n}, r = r_{a_n}; n = 1.2.3 \dots N$$

On the other hand, we have:

$$\frac{1}{\lambda} = \frac{G}{c^2} \quad (9)$$

The fundamental units are illustrated in the following table [1]:

Table 1 Fundamental Universal Units

Dimensions	Value (AAA)	Value (CGS)	Unit
M	1 amr	$2.2 \times 10^{-5} g$	mass unit (m_c)
L	1 $adnaa$	$1.6 \times 10^{-33} cm$	length unit (r_c)
T	1 $aqgrab$	$5.4 \times 10^{-44} s$	time unit (t_c)

The universal constants can be derived from the fundamental units [1], and can be also expressed in terms of Ibrahim constant C as follows:

Table 2 Relations with Ibrahim Constant

Universal const.	Relation with C
maximal universal acc.	$a_c = c^3 C^{-1}$
Cosmological const.	$\Lambda = c^2 C^{-2}$
Hubble's const.	$H = \Lambda C$
the unified energy	$E_c = \kappa C$
Planck's const.	$\hbar = m_c C$
Newton's const.	$G = cm_c^{-1} C$
fundamental charge(sq)	$q^2 = cm_c C$
Ibrahim magneton	$\mu_c = q_c C$

The table shows the importance of Ibrahim constant C and its functional task in formulating the fundamental relations of physics and cosmology.

Values of these constants according to the CGS system of units.

IV. N-TEST EXPERIMENT FROM PLANCK 2018

In the N-Test experiment, the values R_{obs} , M_{obs} for the universe are collected from Planck 2018, and m_c , r_c is

calculated and then the result is compared with the values of elementary particles.

Values of the observed universe R^{obs} and M^{obs} from Planck 2018 based on [4]:

Hubble constant:

$$H_0 = 67.4 \pm 0.5 \text{ km/s/Mpc} = 2.184 \times 10^{-18} s^{-1} \quad (10)$$

Radius of the observed universe:

$$R_{obs} = 4.4 \times 10^{28} \text{ cm} \quad (11)$$

Volume:

$$V = \frac{4}{3} \pi R_{obs}^3 = 3.57 \times 10^{86} \text{ cm}^3 \quad (12)$$

Critical density ρ_c :

$$\rho_c = \frac{3H_0^2}{8\pi G} = 8.53 \times 10^{-30} \text{ g/cm}^3 \quad (13)$$

"Mass – energy" of the universe:

$$M_{obs} = \rho_c V = 3.04 \times 10^{57} \text{ g} \quad (14)$$

Calculation of the comparison $M^{obs} R^{obs}$ with elementary particles $m_c r_c$:

This is the spirit of the N-Test experiment, comparison between macro and micro.

Cosmic rule: For any particle, we write $r = r(m)$, as:

$$r m = r_c m_c = D ; (N^{-1} m_c) \leq m \leq m_c \quad (15)$$

R : radius of the particle . m : its mass

D :moment of inertia per unit length, it is a universal constant for all elementary particles:

$$D = 3.5 \times 10^{-38} \text{ cm g} \quad (16)$$

On the other hand, we have:

$$D = \frac{\hbar}{c} \quad (17)$$

For electron:

$$r_e m_e = 0.386 \times 10^{-12} \times 9.109 \times 10^{-31} = 3.5 \times 10^{-38} \text{ cm g}$$

For proton:

$$r_p m_p = 0.21 \times 10^{-15} \times 1.673 \times 10^{-27} = 3.5 \times 10^{-38} \text{ cm g}$$

We can write Ibrahim function $r = r(m)$ for the microscopic universe by expressing (4.6) in its exponential form (statistical), as:

$$r = \frac{D}{m} \exp\left(1 - \frac{m}{m_{a_n}}\right) ; m_{a_n} \leq m \leq m_{a_1} \quad (18a)$$

When : $m = m_{a_n}$, then : $r = r_{a_n} = \frac{D}{m_{a_n}} ; n = 1.2.3. N$

if: $n = 1$. then: $m = m_{a_1} = m_c$, $r = r_{a_1} = r_c$, so: $r_c = \frac{D}{m_c}$, i.e : $r_c m_c = D$

if: $n = N$. then: $m = m_{a_N} = N^{-1} m_c$, $r_{a_N} = N r_c = R$.

$$\text{i.e : } R (N^{-1} m_c) = D$$

Then, the function $r = r(m)$ is:

$$r m = D ; (N^{-1} m_c) \leq m \leq m_c \quad (18b)$$

When: $m = m_{a_n}$, $r = r_{a_n} ; n = 1.2.3. N$

i.e. quantized masses m_{a_n} , quantized positions r_{a_n} .

As for the case of the observed universe, we write the inverse of the length density $\frac{1}{\lambda}$ as follows:

$$\frac{R_{obs}}{M_{obs}} = \frac{4.4 \times 10^{28}}{3.0 \times 10^{57}} = \frac{1}{\lambda} = 1.5 \times 10^{-29} \text{ cm/g} \quad (19)$$

It is the same value of $\frac{r_c}{m_c} = \frac{1}{\lambda}$ which satisfies with $\frac{R}{M} = \frac{1}{\lambda}$ the equilibrium condition of the macroscopic universe:

$$\frac{r}{m} = \frac{1}{\lambda} ; m_c \leq m \leq N m_c \quad (20)$$

On the other hand, we have:

$$\frac{1}{\lambda} = \frac{G}{c^2} \quad (21)$$

We obtain Ibrahim constant C from D (micro) and λ (macro) as follows:

$$C = c \left(\frac{D}{\lambda} \right)^{\frac{1}{2}} \quad (22)$$

We have [1]:

$$C = \left(\frac{G \hbar}{c} \right)^{\frac{1}{2}} \quad (23)$$

Also [1]:

$$C = \mu_c / q_c \quad (24)$$

μ_c : magnetic moment of Al-Amr, q_c : fundamental charge.

We write the ratio:

$$\frac{M_{obs} R_{obs}}{m_P l_P} \approx \frac{10^{81}}{10^{-42}} = 10^{123} \quad (25)$$

This number (10^{122} - 10^{123}) is the same problem in the Cosmological Constant Problem, $N^2 = 10^{122}$, where $N = 10^{61}$ is the number of the universal mass unit m_c in the universe:

$$\frac{M_{obs}}{m_P} \approx 10^{60} . \frac{R_{obs}}{l_P} \approx 10^{61} \quad (26)$$

From the results of Planck Collaboration 2018 we find that the product $M^{obs} R^{obs}$ divided by the product $m_P l_P$ equals 10^{123} . This coincidence reveals that the ratio of the mass of the universe to Planck mass is approximately equal to the

ratio of its radius to Planck length, which supports the hypothesis that the universe maintains a constant length density λ . It can be written:

$$\frac{R_{obs}}{M_{obs}} = \frac{l_P}{m_P} = \frac{1}{\lambda} \quad (27)$$

V. SOLUTION OF 1700 SUPERNOVAE PANTHEON+

Analysis of 1700 supernovae data from Pantheon+ catalog to prove that the ratio $\frac{\rho_v^2}{\rho^2} = N^2 = 10^{122}$ becomes 1 after correction [6], and that Λ is a cosmological constant that does not change with redshift z .

➤ 1701 light curves for 1550 supernovae of type Ia, from $z=0.001$ to $z=2.26$

$$\Omega_\Lambda = 0.666 \quad \Omega_M = 0.334 \pm 0.14 \quad (28)$$

$$\omega_0 = -0.90 \pm 0.14$$

Compatible with cosmological constant Λ

Original Problem:

Theoretical vacuum energy density from quantum field theory:

$$\rho_v^{th} = \frac{c^5}{G^2 \hbar} = \rho_P = 5.15 \times 10^{93} \text{ g/cm}^3 \quad (29)$$

Observed density from Pantheon+ and Planck 2018:

$$\rho_v^{obs} = \rho_c \Omega_\Lambda = \frac{\Lambda c^2}{8\pi G} = 5.8 \times 10^{-30} \text{ g/cm}^3 \quad (30)$$

Ratio between theoretical value and observed value:

$$\frac{\rho_v^{th}}{\rho_v^{obs}} = \frac{10^{93}}{10^{-30}} = 10^{123} \quad (31)$$

This is the same problem of 10^{122}

The correction that proves that the ratio = 1 [6]:

From Pantheon+ analysis, the Hubble constant and the cosmological constant Λ do not change with redshift z , which proves that Λ is a true cosmological constant. The correction is dividing Planck density by N^2 as decided in the paper

$$\rho_v^{obs(corrected)} = \frac{\rho_v^{th}}{N^2} = \frac{5.15 \times 10^{93}}{(2.72 \times 10^{61})^2} = 6.95 \times 10^{-30} \text{ g/cm}^3 \quad (32)$$

Now, we write:

$$\frac{\rho_v^{th}}{\rho_v^{obs}} = \frac{6.95 \times 10^{-30}}{5.8 \times 10^{-30}} \approx 1.2 \approx 1 \quad (33)$$

Proof that Λ is a constant that does not change:

From Pantheon+ we find:

$$\Lambda = \frac{3H_0^2 \Omega_\Lambda}{c^2} = 1.11 \times 10^{-56} \text{ cm}^{-2} \quad (34)$$

Value $\omega_a = -0.1_{-2.0}^{+0.9}$ from Pantheon+ alone compatible with $\omega_a = 0$ i.e. that $\omega = -1$ is constant does not evolve with z . And this confirms that Λ is a cosmological constant that does not change.

VI. CONCLUSION

The main results in this paper can be summarized in the following points:

- After applying the correction factor $N^2 = \left(\frac{R^{obs}}{l_P}\right)^2 = 10^{122}$ derived from the observed radius of the universe from Planck 2018, the theoretical vacuum energy density matches the observed density from the Planck 2018 catalog with a ratio $\frac{\rho_v^2}{\rho^2} = 1$, which solves the 10^{122} problem and proves that Λ is a true cosmological constant. This indicates the importance of Ibrahim number N and its role in formulating the mathematical relations of cosmology.
- From the results of Planck 2018, we find that the product $M^{obs} R^{obs}$ divided by the product $m_P l_P$ equals 10^{123} . This coincidence reveals that the ratio of the mass of the universe to the Planck mass is approximately equal to the ratio of its radius to the Planck length, which supports the hypothesis that the universe maintains a constant length density λ , and that $\frac{R^{obs}}{M^{obs}} = \frac{l_P}{m_P} = \frac{1}{\lambda}$, the inverse of the length density r/m in this relation is the most important constant to calculate according to the function $r = r(m)$ proposed in the model of the created-built universe. The relation indicates that the spacetime of our cosmic universe is one-dimensional (and it has two absolute opposite directions: the direction of height and the direction of bottom), as for the other directions, they are relative, where the cosmological principle states that "the universe is homogeneous and isotropic in space and time".
- From the analysis of Pantheon+, the Hubble constant and the cosmological constant Λ do not change with redshift z , which proves that Λ is a true cosmological constant. The correction is dividing the Planck density by N^2 , and this confirms the existence of Ibrahim number N and its importance in formulating the mathematical relations of cosmology.
- The data taken from Planck 2018, and the analysis of Pantheon+, verified the following relation for particles in the microscopic universe:

$$r \quad m = D \quad ; \quad (N^{-1} m_c) \leq m \leq m_c$$

The equilibrium condition is verified - for the macroscopic universe - by the relation:

$$\frac{r}{m} = \frac{1}{\lambda} \quad ; \quad m_c \leq m \leq N m_c$$

Then Ibrahim constant C is verified ,as:

$$C = c \left(\frac{D}{\lambda} \right)^{\frac{1}{2}}$$

Al-Amr theory shows that the function $r = r(m)$ is common to both microscopic and macroscopic universes at $r_c(m_c)$, which is the point of the unified force (Al-Amr Force).

All universal constants in Al-Amr theory, and also those were defined in terms of Ibrahim constant C , are verified from Planck 2018 data, and Pantheon+

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