



## Derivation of Standard Model of Cosmology from the Deterministic Unified Field Theory

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**Abstract:** Through series of articles the author has developed a deterministic unified field theory and a modified big bang theory of cosmology. The theories developed were verified by the independent experimental and observational data. In this article, the standard model of cosmology is derived from the deterministic unified field theory developed and thereby confirms the correctness of the theories of cosmology and fields developed.

**Index Terms:** Cosmology, UFT, Derivation and Confirmation.

**I. INTRODUCTION:** The author has developed a unified theory of fields through a series of articles [1-16]. In the paper [1], a deterministic quantum theory is developed. In the paper [2], velocity and energy of the particles is determined. In the paper [3], Fundamentals of deterministic quantum mechanics is analyzed. In the paper [4], particles and fields are analyzed. In the paper [5], a theory of fields and energy is developed. In the paper [6], general theory of gravitational and other fields and it's applications to astrophysics are explained. In the papers [7] and [8], a general deterministic theory of fields is developed. In the paper [9], a modified theory of the early universe is presented. In the paper [10], an analysis of the material universe is made. In the paper [11] an unified theory of cosmology is presented. In the paper [12], deterministic interpretation of quantum mechanics is presented. In the paper [13], the statistical interpretation of the quantum mechanics is disproved. In the article [14], a general formula for all forces of the nature is developed. A new theory of electromagnetic radiation and propagation of waves is developed based on the electrical charges. The new theory developed is applied to develop a new theory of cosmology.

In the article [15], Kardshev scale is modified. Principles based on which the cosmos is designed is explained in the article [16]. In the same articles, the relationship between Cosmology and Cybernetics is explained. In the article [17], design principles for making a new world are explained.

In the article [18], the unified field theory developed was applied to explain the origin of planetary magnetic fields and verified by the measured and observed data. This is verification for unified theory of gravitational and electromagnetic fields. In the same article, the unified field theory developed based on the classical physics for all the fields of the nature is verified by the experimental and observational data. In the article [19], the standard model big bang cosmology is interpreted by applying the Newton's gravitational force laws and the Faraday's lines of forces. The interpreted theory proves the existence of center of universe. The interpreted theory is verified by the observational evidences.

As explained in the previous paragraphs, in addition to developing a Unified theory of fields, a Modified big bang theory of cosmology is developed. The theories developed were verified by the experimental and observational data. In this article, the modified big bang theory of cosmology is derived from the unified field theory and confirms the correctness of the theories developed.

**II. ABSOLUTE SPACE:** Existence of absolute space was believed by the Great scientists like Sir Isaac Newton [20], Albert Einstein [20], Mathematicians like Euclid [20], philosophers like Thiruvalluvar [21], Avvaiyar [22] and the western religions [23]. Literal meaning of absolute space is empty space or space with nothing inside. As per the Bible [24], light (energy) originated first and it made night and day. This means time started with the birth of light (energy). As per the Bible, God made the material world and the life forms. So, before the birth of the light darkness permeated the world. Biblical cosmology is an earth centered cosmology. So, the concept of time is based on the day and night observed from the earth. But the time can be counted in the backward direction till the time of beginning of the entire world. So, before the birth of light (energy), the entire world was empty or empty space. From this absolute space, energy originated. But how can something originate from nothing? Therefore, there is something in the absolute space which is not accessible to the human senses. Bible calls this Ultimate intelligence as God. So, as per the Bible divine is isolated from the material world. Albert Einstein believed in this divine being. Rabindranath Tagore [23], didn't believe in the isolated divinity and believed in the oneness of God and the material universe.

Both the classical and quantum electromagnetic field theories were developed in the absolute space. So, the theories of the early universe are in the absolute space. From this energy dominated early universe, the matter dominated universe originated. General theory of relativity could be applied only in the matter dominated universe to avoid the singularity which originates if the general theory is applied in the beginning of the world. Singularities originate in the physical problems if unrealistic assumptions are made. So, the assumption of oneness of space and field made in the general theory of relativity is incorrect. So, the author derived the unified field theory and the modified big bang cosmology theories in the absolute space and the theories were verified by the experimental and observational data.

**III. UNIFIED FIELD THEORY AND COSMOLOGY:** As explained in the previous paragraph, the material world originated from the energy as per the religious and scientific theories of cosmology. Energy contains field. So, all other forms of energies and fields originated from the electromagnetic energy and field. So, all forms of fields could be integrated in principle. The author has integrated all fields and formulated a single formula for all fields. This formula was verified by using experimental and observational data. In this section, modified big bang cosmology is derived from the unified field theory formula.

The general formula for fields [18] is  $E = G.M/R^n$ ,  $2 < n < N$ , if  $R > R_p$  where  $G$  is gravitational constant,  $M$  is the mass or the equivalent mass of the particle,  $R$  is the radius in the spherical coordinate system,  $R_p$  is the radius of the particle,  $n$  is a positive number and  $N$  is the maximum value of  $n$  and  $E = G.M/R^n$ ,  $1 < n < 2$  if  $R < R_p$ . This general formula of fields is valid for all the particles of the universe which includes all the energy, charge and the matter particles. Since the matter dominated world originated from the energy dominated world, the history of the world could be easily traced from the formulae for the field radiated by the particles.

As per the modern theory of cosmology, all particles originated from the photons. So, Photons were the first particles originated in the universe. The near field of the first photons was  $\infty$  as per the general formula of the fields. This means photon energy and density was infinity. The field was zero at  $R = \infty$ . Since the field  $E$  was infinity at  $R = 0$  (Starting point of the world or the center of the world), speed of the photons was infinity. As  $R$  tends to infinity,  $E$  tends to zero and so, the speed of the photons was zero. So, the speed of the light or energy varies from infinity to zero as  $R$  increases from zero and tend to infinity. In the far field, the speed of the light could be approximately considered to be constant and that constant is well known  $3 \times 10^8$  m/s. So, the universe has energy dominated transient part and matter dominated steady state part.

So, the universe in the beginning was very hot and dense and expanded at very high speed much greater than  $3 \times 10^8$  m/s and cooled down to produce nuclear, atomic and molecular particles. So, with the production of matter particles nuclear and gravitational fields also were produced from the electromagnetic fields. Electromagnetic fields were converted into nuclear and gravitational fields when the electromagnetic energy was converted into nuclear and gravitational energies and the energies of the masses. As  $R$  tends to 0,  $E$  tends to infinity and decreases if  $R$  increases. So, for  $R > 1$ ,  $E \approx M/R$  because  $1/R$  is  $\gg 1/R^n$  for  $R > 1$  and  $n > 1$ . Similarly, if  $R$  tends to infinity,  $E \approx M/R$ , for  $R > 1$  because  $1/R$  is  $\gg 1/R^n$  for  $R > 1$  and  $n > 1$ . This means, in the beginning and at the end of the world, energy dominates over the matter. The matter dominated world exists in between the energy dominated worlds.

If  $R < 1$ , then  $1/R^n \gg 1/R$  where  $n > 1$ .  $E = G.M/R^n$  and so, the field  $E$  increases with the increasing value of  $n$ . So, as  $n$  tends to infinity,  $E$  tends to infinity. At sub atomic and sub nuclear scales,  $R \ll 1$  and so,  $E$  increases with the increasing value of  $n$ . As  $n$  tends to infinity, the terms  $1/R^n$  where  $n < \infty$  can be neglected. So, the higher order terms in  $E = G.M/R^n$  are for sub atomic and nuclear fields. Planckans are the smallest particles of the world as explained in [18]. A photon is made up of Planckans. So, all the particles of the universe originated from the Planckans. Planckans must had existed as separate particles in the beginning at very high temperature conditions and then by proper integration of Planckans, when the energy expanded and cooled, charged, energy and neutral particles were produced.[25-26]

The energy at the end of the universe will come back to the center of the world if the universe is an automatic feedback control system. The earth centered world is an automatic feedback control system and so, the history of the humanity is cyclical. History of the earth, plants, animals and the people has many cycles. For example, the eco cycles of biological world, seasonal variations of the earth, human population growth control, etc. are the cycles in the earth based local world cycles. In Physics, laws are invariable with the variation of the distances of the universe. So, the laws of the local earth centered universe could be extended to the large scale universe. In fact, the Biblical cosmology is earth centered cosmology. But this earth centered cosmology is proved to be correct by the science at the large scale universe levels.

Another great evidence to prove that the history of universe is cyclical is the history of the human progress. Man is a microcosm and is the ultimate product of the nature [27]. So, if we know all about humanity, we will know all about the universe. All the inventions to satisfy the external human senses were made now and even computers which are compared with the human brain were made. Like human head communicates, computers too are communicating with each other and also with the human beings. So, one cycle of human progress is made by this time. Human beings began to make cultural progress from 6000 to 7000 years ago, as per the estimates of the historians [28-32]. Modern world originated from the integrated culture of the ancient Greeks, Romans, Jews and Christians. This integration started from some 4500 years ago. Ancient Greeks made the first great discoveries and inventions during their age (500BC to the beginning of Christian and Roman era). Then these four cultures began to be integrated since the beginning of Roman age. From this integrated culture, modern world began to originate since some 500 years ago.

So, there are three cycles of progress each with approximately 2000 years period within the cycle of period 6000-7000 years. Therefore, one could postulate that the history of the universe is cyclical.[33] Therefore, matter dominated world originates from the energy dominated world and once again it becomes energy dominated world at the end and this energy from the end of the universe goes back to the center of the world. During the initial transient period of the world, the energy expanded and compressed back with very high speed

and so on. Then when the universe reached the steady state, matter particles were made and amplitude of the cycle became constant. During the transient period, amplitude of the cycles declined exponentially till the time at which the steady state universe started.

**IV. CONCLUSION:** The modified standard big bang model of the universe was derived from the unified field theory. The derived model indicates that the speed of the light varied from the infinite value to zero as the expansion increased from zero distance to infinity. As the expansion reached the far field region, the speed became approximately constant value of  $3 \times 10^8$  m/s. This region is steady state universe or matter dominated world. The derivation also confirms the correctness of the unified field theory and the modified big bang cosmology. In the last section the universe is proved to be an automatic feedback control system.

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