

Explanation of Time Dilation of High Redshift Quasars, Surface Brightness, and Cosmic Microwave Background with the Stress Cosmology

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Abstract: The Big Bang theory is believed to be based on three problems to the tired light model. In this report, “time dilation of high redshift quasars” is first explained with the stress cosmology. A proceeding (delaying) speed of time is shown as a logarithm of changed energy. Second, “surface brightness” relates to “time dilation” and the combined luminosity per unit time. It decreases with time dilation. Third, according to the stress cosmology, the “cosmic microwave background” is explained with a relation between movement distance and decreasing energy quantity of discharged light. Thus, three problems can be explained with the stress cosmology being part of the tired light model. Therefore, there is no absolute proof of the Big Bang theory. Moreover, there is a fatal contradiction relating to the first law of thermodynamics in the Big Bang theory. The Big Bang theory required that the universe be a closed system according to the first law of thermodynamics. *Nevertheless, the ekpyrotic universe theory is utilized to explain the Big Bang.* The first law of thermodynamics indicates that our universe was an open system. The Big Bang theory is optional.

Keywords: Big Bang theory, speed of time, ekpyrotic universe, tired light model, first law of thermodynamics

Introduction

It was reported that a stress equation does not require Big Bang, dark matter and dark energy (Yanagisawa, 2004; 2011; 2015; 2019; 2022). Nevertheless, the Big Bang theory (Chernin, 1995; Gamow, 1946; Friedman, 1922; Narlikar, 1991) is believed due to three issues (Lewis, & Brewer, 2023; Churazov, et al., 2012; Ahumada, et al., 2020; Fixsen, 2009; Penzias, & Wilson, 1965) with the tired light model (Wright, 1987). They are explained in this report using the stress cosmology (Yanagisawa, 2004; 2011; 2015; 2019; 2022) as part of the tired light model. Therefore, there is no definitive evidence supporting the Big Bang theory.

Moreover, the Big Bang theory contains a fatal contradiction regarding the first law of thermodynamics (Smolin, 1997). It required that the universe be a closed system according to the first law of thermodynamics. Nevertheless, the ekpyrotic universe theory (Buchbinder, Khoury, & Ovrut, 2007) is used to describe the Big Duet. The first law of thermodynamics indicates that our universe was an open system.

Explanation of the Stress Cosmology

Their contents are similar to that found in the author's previous articles (Yanagisawa, 2004; 2011; 2015; 2019; 2022), but it is repeated in this report because of its importance. First, it was

reported that there is no absolute time (Yanagisawa, 2004; 2019). A precondition of atomic time (e.g., atomic clocks) being absolute is an existence of absolute length. Moreover, a precondition of the atomic length (e.g., atomic telemeter) being absolute is an existence of absolute time. Therefore, a chicken-and-egg paradox can be found in them.

Conversely, it was reported that time occurs with change of energy as follows:

$$t = \frac{\log \frac{E(t)}{E(0)}}{k} \quad (1)$$

Here, E (t), E (0), t and k represent the amount of energy at time “t,” the quantity of energy before, time and a constant, respectively. Equation 1 was deduced from a stress equation as follows.

$$\frac{dE(t)}{dt} = kE(t). \quad (2)$$

The author believed that stress is proportional to the amount of energy based on his clinical experiences (Yanagisawa, 2019; 2022). If the absolute value of k is large, our universe will be destroyed. Therefore,

$$0 > k \gg -1 \quad (3)$$

From Equation 2,

$$E(t) = E(0)e^{kt} \quad (4)$$

Here,

$$e^k = 1 - \alpha \quad (0 < \alpha \ll 1) \quad (5)$$

From Equations 4 and 5,

$$E(t) = E(0)(1 - \alpha)^t \quad (6)$$

From Equations 5 and 6,

$$(1 - \alpha)^t \cong 1 - \alpha t \quad (7)$$

From Equations 6 and 7,

$$E(t) = E(0)(1 - \alpha)^t \cong E(0)(1 - \alpha t) \quad (8)$$

$$E(t) = E(0)(1 - \alpha t) \quad (9)$$

The Big Bang theory is shown as Equation 9. Therefore,

$$\alpha = \frac{1}{13.8 \text{ billion}} \quad (10)$$

A relation between Equations 6 and 9 is shown in Figure 1. Here, the vertical axis represents the quantity of energy at time (t) or E (t), whereas the horizontal axis represents time t. Each Equations 6 and 9 are shown as a dotted curve (points D, A, and S) and a solid line (points D, B, and M).

Relation between the Stress Cosmology and Time Dilation of High Redshift Quasars

From Equation 1, a speed of progress (delay) is shown as a logarithm of changed energy. A changing degree of energy is equal to an angle of the tangential line at time t. From Equation 6, the tangential line at time t is shown as

$$Y = kE(t)t + E(0) = kE(0)(1 - \alpha)^t t + E(0) \quad (11)$$

An angle of the tangential line at time 0 is δ . Therefore, the time speed of energy observed on Earth according to the stress cosmology is

$$\tan \delta = kE(0) \quad (12)$$

In Figure 1, each point tB and M is 12.0 billion years and 13.8 billion years. According to Big Bang theory, a point B is an energy quantity from a distant heavenly body of 12.0 billion light years. From Equation 9,

$$E(12.0 \text{ billion years}) = E(0)(1 - \alpha \times 12.0 \text{ billion years}) \quad (13)$$

The energy quantity of point A and C is equal to that of point B. Point tA is a time of point A according to Equation 6. From Equations 6 and 13,

$$E(tA) = E(0)(1 - \alpha)^{tA} = E(0)(1 - \alpha \times 12.0 \text{ billion years}) \quad (14)$$

The angle of the tangential line (P-Q) at point A is θ . According to the stress cosmology, the time speed of the energy discharged on 12.0 billion years ago is from Equation 11,

$$\tan \theta = kE(0)(1 - \alpha)^{tA} \quad (15)$$

From Equations 10, 14 and 15,

$$\tan \theta = E(0)\left(1 - \frac{12.0 \text{ billion years}}{13.8 \text{ billion years}}\right) \cong 0.13kE(0) \quad (16)$$

Meanwhile, an angle of Equation 9 according to the Big Bang theory is ω . Therefore, the time speed of energy observed on Earth according to the Big Bang theory is

$$\tan \omega = -\alpha E(0) \quad (17)$$

From Equations 5, 12, and 17, we obtain

$$\lim_{\alpha \rightarrow 0} \frac{\tan \delta}{\tan \omega} = \lim_{\alpha \rightarrow 0} \frac{kE(0)}{-\alpha E(0)} = \lim_{\alpha \rightarrow 0} \frac{\log(1 - \alpha)}{\alpha} = 1 \quad (18)$$

Therefore, the time speed of energy discharged 12.0 billion years ago can be compared with the time speed of energy observed on Earth according to the Big Bang theory. From Equations 5, 10, 16, 17, and 18, we obtain

$$\frac{\tan \theta}{\tan \omega} \cong \frac{0.13kE(0)}{\frac{E(0)}{13.8 \text{ billion years}}} = 1.794 \text{ billion years} \times \log \left(1 - \frac{1}{13.8 \text{ billion years}} \right)$$

(19)

This author believes that an answer to Equation 19 is approximate one-fifth according to the observed time dilation of high redshift quasars.

Relation between Time Dilation and Surface Brightness

The surface brightness of a galaxy (I) (Churazov, et al., 2012) is

$$I = \frac{L}{4\pi D^2} \quad (20)$$

Here, L and D are the combined luminosity per time and a small side patch in a galaxy. If the observation time is short, L is small. Moreover, if it is very long, the total L will become large. It means that L will change with time dilation. Therefore, decreasing density can be explained with decreased numbers of photons per unit of time in the stress cosmology. Five photons (P1–P5) per unit of time were discharged 12.0 billion years ago from very distant quasars, as shown as A in Figure 2. Here, the horizontal axis is a degree of time dilation. Due to time dilation of approximately quintuple, their photons are observed on Earth as B in Figure 2. Time t1 in area A lags behind times t1-t5 in area B. Therefore, a galaxy's surface luminosity per unit of time decreases to approximately one-fifth in below B.

Consequently, time dilation can explain the problem of the surface brightness. Moreover, time dilation was explained by the inclusion of stress cosmology in the light tired model. In contrast, Equation 2 does not exist in any other tired light model besides stress cosmology.

Relation between 2.7K Cosmic Microwave Background and the Stress Cosmology

After time tS, the light (electromagnetic wave) discharged with energy quantity E(0) will become energy quantity of 2.7K cosmic microwave background (CMB) (Ahumada, et al., 2020; Fixsen, 2009; Penzias, & Wilson, 1965), according to the stress cosmology in Figure 1. From Equation 6,

$$E(tS) = 2.7 \text{ K} = E(0)(1 - \alpha)^{tS} \quad (21)$$

From Equation 21,

$$tS = \log_{(1-\alpha)} \frac{2.7 \text{ K}}{E(0)} \quad (22)$$

Therefore, tS is small when $E(0)$ is small. In Figure 3, the horizontal axis of Figure 1 is reduced by half. Moreover, the energy quantity $D1$ as light (electromagnetic wave) that identifies a heavenly body is max. The energy quantity $D2$ as light identifying a heavenly body is minimum. The energy quantity of $2.7K$ is shown as a dotted line (points R, S2, and S1). A narrow dotted curve ($D2-S2$) is a decreasing energy quantity of light discharged with the energy quantity of $D2$ according to Equation 6. A narrow solid line ($D2-M$) is a change according to Equation 9. From Equation 9, the Big Bang age of energy quantity $D2$ equals energy quantity $D1$. Each light with each energy quantities $D1$ and $D2$ will become energy quantity of $2.7K$ after time $tS1$ and $tS2$. From Equation 22,

$$tS1 = \log_{(1-\alpha)} \frac{2.7 K}{D1} \quad (23)$$

$$tS2 = \log_{(1-\alpha)} \frac{2.7 K}{D2} \quad (24)$$

Moreover, $tS1$ is much larger than 13.8 billion years. It is near infinite. Here, a light of the energy quantity $D1$ decreases to the energy quantity of $D2$ after time $tS3$. From Equation 6,

$$E(D2) = E(D1(1 - \alpha)^{tS3}) \quad (25)$$

From Equation 25,

$$tS3 = \log_{(1-\alpha)} \frac{D2}{D1} \quad (26)$$

Each discharged light of energy quantities $D1$ and $D2$ can be observed as an electromagnetic wave identifying a heavenly body until time $tS3$ and immediately after discharge. Because the high energy quantity $D1$ rate is very few, it can be observed as a heavenly body with only a few directions until time $tS3$. Therefore, the heavenly bodies identified with light are sparsely observed. However, each discharged light of the energy quantities $D1$ and $D2$ is observed as CMB if discharged in the old periods $tS1$ and $tS2$. Furthermore, the period of approximate $2.7K$ is much longer than the period $tS1$ and $tS2$. Moreover, in an electromagnetic wave below the energy quantity $D2$, an electromagnetic wave is observed as $2.7K$ CMB immediately after discharge. Therefore, the period that CMB is observed may be from now until almost infinite past. The rate at which a heavenly body discharging some electromagnetic wave exists in a direction is very high in this period. This is the reason that CMB is observed from all directions. In other words, the direction that CMB is observed is not related to the existence of a heavenly body observed with identifying light. CMB is the wreck of all electromagnetic wave discharged from near to far more distant heavenly bodies than 13.8 billion light years. Moreover,

$$\lim_{\alpha \rightarrow 0} E(0)(1 - \alpha)^t = 0 \quad (27)$$

Therefore, it is predicted with stress cosmology that CMB of a lower temperature than $2.7K$ will

be observed.

Results

Time dilation of high redshift quasars, surface brightness and cosmic-wave background can be explained with the stress cosmology. Therefore, three problems can never become an absolute proof of the Big Bang theory.

Discussion

Many contradictions to the theory of the Big Bang have been reported (Yanagisawa, 2004; 2011; 2015; 2019; 2022). Specifically, the Big Bang theory contains a fatal contradiction regarding the first law of thermodynamics. The Big Bang theory was developed under the premise that our universe was a closed system in accordance with the first law of thermodynamics (Smolin, 1997). Nevertheless, the ekpyrotic universe theory (Buchbinder, Khoury, & Ovrut, 2007) is used to explain the Big Bang. The first law of thermodynamics indicates that our universe was an open system. Moreover, three problems (Lewis, & Brewer, 2023; Churazov, et al., 2012; Ahumada, et al., 2020; Fixsen, 2009; Penzias, & Wilson, 1965) are regarded as irrefutable evidence for the Big Bang theory. However, they could be explained by the stress cosmology being a component of the tired light model.

Conclusion

“Time dilation of high redshift quasars,” “surface brightness,” and “CMB” can be explained with the stress cosmology. Therefore, three problems can never become an absolute proof of the Big Bang theory.

Figure 1

Relationship between Equation (6) and (9)

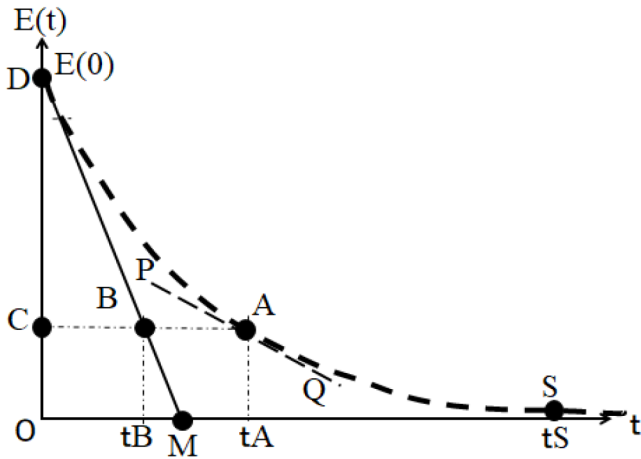


Figure 2

Relationship between the combined luminosity and time dilation

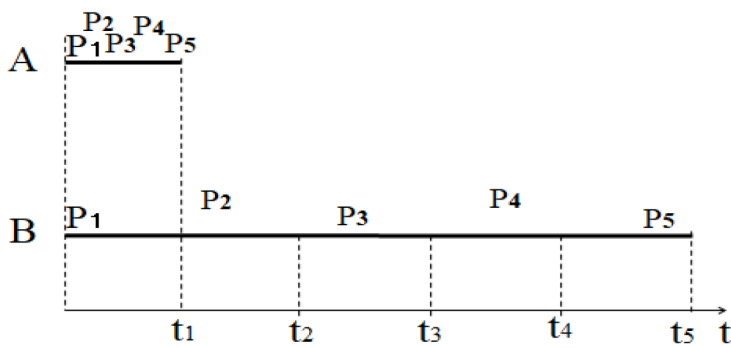
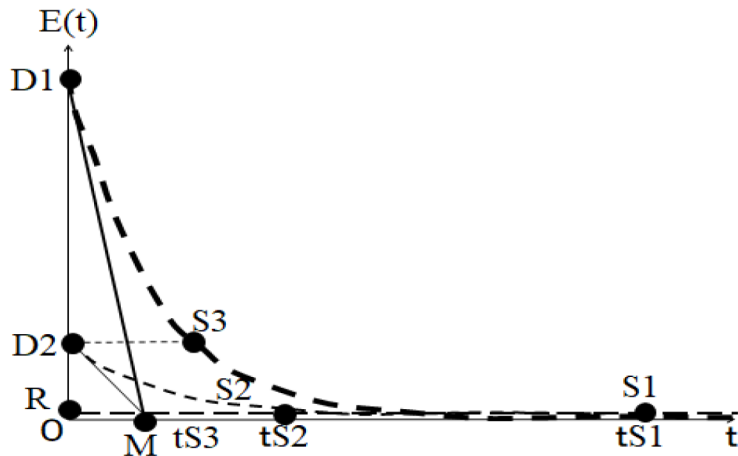


Figure 3

Relationship between 2.7K “cosmic microwave background” and the stress cosmology



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