Inertial Time Dilation Predicts Observed Celestial Redshift Patterns, CMB without Invoking the Big Bang

By Tom DeGerlia 9 min

Abstract

The Space-Time equivalence (STE) [] states that the curvature of space-time arises from relative moment of inertia, and that general relativity is a product of this relationship. Specifically, gravitational time dilation (GTD) is derived directly from time dilaton of scale (TDS). However, GTD only represents a portion of the time dilation experienced by a system relative to another system, and the complete picture may explain the magnitude and deviation of observed redshift values without invoking expansion of the universe. If confirmed, the relationship between universal expansion and redshift may require reinterpretation.

Introduction

The Space-time Equivalence and the underlying principle of time dilation of scale [] posit that the pace of change in motion is directly related to that system's moment of inertia, for every system or subsystem in the universe. Abstracted mathematically from isometric scaling laws, the STE is t1/t2=(i2/i1)^(1/5), where t represents the delta time for systems 1 and 2, respectively, and i represents moment of inertia about the axis that connects the two systems being compared. Gravitational time dilation [] can be derived directly from the law of space-time equivalence, ho

The principle of time dilation of scale (TDS) that arises from the law of space-time equivalence (STE) predicts the observed redshift in excess of the gravitational redshift alone due to the relationship between time and inertia. STE reveals that inertia bears the fundamental relationship with space-time and that its curvature is not merely a mass influence, as understood through general relativity.

How Density, Mass, Volume, and Inertia Interrelate

Systems that are both relatively massive and relatively expansive can achieve extreme moments of inertia. For example, a black hole can have an extreme mass, but because it is very dense, interpreting it as a point mass is a reasonable approximation. However, on average, a galactic cluster contains a variety of extremes in density and distribution, resulting in a greater moment of inertia about the axis of observation, and the observed redshift would be considerably greater than what is predicted by general relativity alone, especially in the vicinity of highly variant systems.

The most extreme moments of inertia are achieved through systems with little mass at the axis, and almost all matter at the radius. A soap bubble, for example, is a sphere with a very high moment of inertia relative to its mass. A sphere shell is the highest moment of inertia that can be achieved with a uniform spherical configuration. The highest density distributed uniform system, on the other hand, is looked at slightly differently. A cloud is essentially a low-density object, and low-density objects (objects that display less gravitational effects at the densities of our scale than larger-scale objects like planets, etc), of course, can be virtually any shape. Things are at liberty to take on configurations of extreme relative moments of inertia at our scale. A tree has a pretty big moment of inertia, but that same tree at a mass of 1e27kg would be a sphere with a density gradient representing the constituents of the tree. A few orders of magnitude more massive, at the tree's Schwarzschild radius, the tree is a uniform sphere. So the highest inertia objects are large regions of space that amount to a low-density core and a high-density shell. A big celestial gas cloud with stars around the edge.

A big void of near-scale matter (a “vacuum” of space as we know it) bounded by high-density objects. (Footnote, under scale relativity, an object can be defined as any static region of space or as any static collection of matter.) A nebula comes to mind as an example of a massive object that appears to consist often of a core of “transparent” sub-atomic matter (matter too small to absorb visible light energy), with lobed outer portions or appendages that are translucent and cloudy, eventually turning to “solid-looking” portions at the outer edges. Nebulae concentrate stars in the outer, cloudy regions. As such, A nebula is likely a relatively high moment of inertia celestial object from our perspective, and thus is a good candidate for observing extreme inertial red-shift. A galactic cluster is as well. These systems very likely represent the kinds of distributions responsible for observed LRDs (little red dots).

Rule of thumb regarding inertial system transformation

- for a given mass the highest moment of inertia is the lowest radius = lowest density

- for any given radius, the highest moment of inertia is infinite mass = infinite density
- for a given density, the highest moment of inertia is achieved through configuring that mass density away from the axis. So a bubble really does represent the highest moment of inertia of objects, relative to their mass.

Premise of this Study

- While GTD describes a portion of the redshift observed between systems, the complete picture can only be understood through TDS, which states that space-time has a more comprehensive mathematical relationship with the relative moment of inertia (or relative density) of any given system. TDS intrinsically incorporates the time dilation attributed to GTD under general relativity as a component of the overarching “inertial time dilation." This phenomenon is well explored by our team, but not yet recognized by mainstream physics, and the inclusion of this principle into the standard model will greatly simplify its interpretation, strengthen its accuracy, and extend its coverage far beyond our current understanding.
- The observed redshift is known to be in excess of that which should be observed from GTD; after all, that is the reason for the universal expansion hypothesis, and therefore, there is an inconsistency between expectation and observation. Under the Standard Model, this has been explained through the Big Bang Theory, which characterizes the universe as expanding outward from a spatial origin. Many new inconsistencies arise from this hypothesis of explanation, and among them, there have been significant observed localized variations in redshift measurements that are inconsistent with the predictions associated with universal expansion. Further, the James Webb telescope has, to date, struggled to detect the predicted primordial universe as hypothesized.

Hypothesis

These deviations in observed and expected redshift are very likely to be the effects of TDS, or “inertial time dilation”. If so, the standard model would be simplified considerably by eliminating the need for additional explanation via galactic redshift. This would also eliminate the mathematical need for constructs such as singularities, nonexistence, the beginning or end of time and space, or any other implications of the Big Bang theory.

Whether or not this proves to be true, we predict no different behavior than what has been observed. If the hypothesis proves true, it would call into question the hypothesis of universal expansion, which would be a departure from established hypotheses of the origins of the universe. But one that would greatly simplify, expand, and explain our understanding of our universe.

Confirming the Hypothesis

The expected observations would be very distinct between universal expansion and gravitational time dilation vs. inertial time dilation. As gravitational time dilation only represents the “high-density” aspect of the broader inertial time dilation, predictions of time dilation under low-density conditions will therefore always be exceeded by observations. Extremely massive but relatively low-density and simultaneously extremely expansive systems, systems with a more extreme surface area to mass ratio, the opposite of a condensed sphere, a highly distributed mass, characterize high-inertia systems.

Validation 1: Redshift

- Universal expansion would exhibit the same rate of redshift everywhere in the universe.
- TDS would exhibit a different redshift depending on the granularity of the measurement and the total moment of inertia of a system.
  - A nebula or galactic cluster would exhibit considerably more redshift *than expected* compared to what we would see around a black hole, neutron star, or massive Star, where gravitational redshift is expected. A planetary system might exhibit more redshift *than expected* relative to the massive star itself.
  - A galaxy would be observed to exhibit more redshift when viewed along its axis of rotation, and as little as i^(1/2) if observed perpendicular to its axis of rotation. So galaxies and objects observed along their axis of rotation will exhibit the maximum redshift possible for that system, and therefore would exhibit considerably more redshift *than expected* from GTD alone.
  - Systems with a lower moment of inertia relative to our inertial frame of reference will exhibit a blue shift, generally have a smaller spatial scale, and exhibit faster average motion.
  - Massive galactic clusters and similar structures would exhibit a similar degree of inertia to extremely high-mass objects. Thus, we would be able to attribute all observed redshifts, including Little Red Dots and other anomalous observations, to TDS.

Validation 2: The Primordial Universe

The primordial universe, redshift, the beginning of time, and the entire Big Bang:

- Universal expansion would reveal a primordial universe if we observed at locations close to the origin of the Big Bang. We would see very old structures forming in the primordial universe, and would expect to observe no older structures anywhere in the universe.
- TDS would reveal older structures, no matter where we look in the universe. No matter how far back in time we look, we will see roughly the same structures consistent with the scale being observed. We would never observe evidence of the primordial universe absent evidence to the contrary. For example, we might observe a structure that seems primordial, but there will also be what appear to be far older objects present.

Verification 3: Observed Singularities

- Universal expansion would reveal tangible, real-world examples of singularities.
- TDS would reveal an absence of tangible singularities, infinities, and pre- or post-existence. Properties would extend in extent and precision without tangible limits. We would continue to expand the extent and precision of observation.

Verification 4: The Cosmic Microwave Background

- The standard model says that the CMB indicates that the universe has a limited scale range. The interpretation of the CMB is intimately tied to the interpretation of universal expansion.
- TDS predicts the observed CMB as an artifact of energy detected from particles just beyond the limits of practical observability (i.e., smaller than subatomic and larger than the observable universe). The CMB would be observed to be identical at every scale of section at every point in space. TDS does not rely upon its own conclusion as a premise, and because it predicts both observed redshift and observed background energy, neither established interpretation is positioned to serve as a logical counterpoint.

Identifying the Moment of Inertia of a Galaxy or Galactic Cluster?

To calculate the moment of inertia, one must first consider the angle of observation or influence. If one or both of the systems being compared (observed and observer, or system a and system b) are not spherical, inertia is dimensional, so observations of moment of inertia must take into account the moment of inertia along the axis of observation. But as long as you are observing dimensionally, you can abstract a high moment of inertia by using averag edensity and total mass (or average density and total volume - conceptually very similar to the Schwartzchild radius).

So, to abstract the moment of inertia of a “gaseous” distribution of matter, one must determine the average radius of mass about the axis of observation. For a system of uniform density, like a dense cloud of stars

A galactic cluster’s inertia comes down to its average density. Simply take the mass of the distributed system, and divide that by the volume of the system to get average density. From this one can estimate moment of inertia from density and cross-sectional area about the axis of observation. to get moment of inertia, take a uniform sphere of that density and calculate using 2/5Mr^2 formula. This relates the mass and density of a sphere to inertia of a sphere.

Textbook examples:

Galaxies density: Moment of inertia. volume, mass, general shape or distribution.

Galactic cluster density: Moment of inertia. volume, mass, general shape or distribution.

Calculations and Observational Data Analysis

Look at james Webb data

Conclusion

From this, we conclude that the STE explanation for the universe is very viable mathematically as it (10 based in well established physical principles, (2) correctly pedicts the general variation observed. And (3) because it explains a number of phenomenon that the Standared Model struggles to explain by the Standard Model.

Implications

If TDS, STE, and the principles described herein are validated through peer review and rigorous observational and experimental testing, it will garner revision of the standard model. The introduction of the inertial time dilation into the standard model and general relativity will greatly expand our tangible understanding of how space, time, and matter interrelate. And will afford physics a long-needed opportunity to grow beyond the limitations and mysteries imposed by our current models, free of the significant obstacles of presumption and systemic misinterpretation of observed data.

That said, validating TDS would not, to my knowledge, change even a single measurement ever recorded. It only affects the interpretation of the measurements we have made and the predictions we make in the future.