# One Parameter Redshift Model matching measured values near, middle, and far reaches of universe perfectly

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#### Abstract

This paper presents a model that predicts the redshifts as well as measured values, but without adjustments by dark energy, dark matter or comoving distances. There is only one parameter. It is the fraction of time since emission of the light. The parameter also adjusts for dust in the universe that attenuates light brightness as dust may be reducing brightness by almost 5 magnitudes. The assumption is that light hits an object moving at the speed of light. The model of the universe is spheres made out of spheres. The model is called "Sempiternal Steady State Spinning Sphere Theory", aframework unifying particle masses via vacancy defects in cuboctahedral packing of a granular universe. The model proposes an eternal spinning sphere universe (radius 3.018 billion light-years, mass  $\sim 1.636 \times 10^{54}$  kg) with continuous matter creation and destruction, driven by both attractive and repulsive gravity dynamics. A redshift comparison table validates the model against measured values of redshift, suggesting resolution to the Hubble tension due to assumptions from a steady state universe verses a big bang universe. There are two graphs, the first showing how accurately the model predicts redshift vs actual data using the LambdaCDM model. The second showing that the Lambda CDM model has very unusual curve that would require tremendous changes of energy and force in the universe inexplicably. There is also a section that finds that the attenuation constant, overall, for the universe for ultraviolet light is about 2.5. This paper predicts an attenuation constant of about 2.38, for whatever causes the attenuation of the redshift.

### 1 One parameter, look back time over total light travel time models redshift

The Sempiternal Steady State Spinning Sphere Theory posits that spacetime is granular, composed of Planck Spinning Spheres arranged in a cuboctahedral lattice with vacancy defects driving particle masses. It is the Planck Spinning Spheres, with the edge spinning at the speed of light that make the one parameter model work.

The parameter is how far something has traveled since it was emitted from the source divided by the maximum amount of distance light can travel in the universe. The maximum amount of time light can travel in the universe is what we calculate with the big bang model to be the age of the universe. But is actually the maximum amount of time light can travel. For example, galaxy A1689-zD1's light was emitted 13 billion years ago and is calculated to have a red shift of 7.6 The calculation for column c is 13.11 billion years with a redshift of 7.497. Practically identical. Each example shows the model remarkably predicts redshift with one parameter throughout the universe. It is likely redshift will behave differently before recombination. I believe this model works because the light from the universe, when it is absorbed, is absorbed into a smaller dimension of a universe that is granular. It is a universe that is a sphere made of spheres. These are called Planck Spheres in this model, and the Planck Spheres, just like the universe it self is moving at the speed of light at its edge. This model also includes a component adjusting for light attenuation and volume of universe after the light was emitted. The first table shows how well Equation 1 predicts the redshift compared to the Lambda CDM model. The second table showing that Equation 1 predicts a redshift curve that is much more linear making it look like LambdaCDM predicts enormous fluctuations in force and energy levels, that may not be there at all. Equation 1 shows that a Spinning universe, with a continuous medium, made of spheres with a continuous medium makes a better and more simple prediction for redshift than the big bang theory. This redshift does not have to use dark energy, dark matter, or comoving distances to predict redshift in the galaxy.

The following is a graph of the equation in section 3 for redshift using this model verses actual redshift data using the Lambda CDM model



Figure 1: Redshift vs. Time since emission

1	2	3	4	5	6	7
fraction	time	time since	Light	Galaxy	galaxy	Z for
since	frac	light	attenuated		emitted	galaxy
light was	tion	emitted	red		light	
emitted	emitted	Gyears	shift		Gyears	
a	b	с	Z	е	f	g
0.020	0.980	13.4946	13.2911	HD-1	13.5	13.27
0.027	0.973	13.3982	11.1159	GN-Z11	13.4	11.09
0.036	0.964	13.2743	9.3049	MACS1149-JD1 (JD1)	13.28	9.11
0.056	0.944	12.9989	6.9660	A1689-zD1	13.0	7.6
0.070	0.930	12.8061	5.9601	Zhulong	12.8	5.2
0.092	0.908	12.5032	4.8677	Aless-073.1	12.5	4.755
0.099	0.901	12.4068	4.5988	BRI 1335-0417	12.4	4.4
0.107	0.893	12.2966	4.3244	A2744-GDSp-z4	12.3	4.03
0.150	0.850	11.7045	3.2513	Big Wheel Galaxy	11.7	3.245
0.179	0.821	11.3052	2.7627	CEERS-2112	11.3	3.03
0.274	0.726	9.9970	1.7732	Mingus	10.0	1.713
0.637	0.363	4.9985	0.4722	RX J1347.5–1145	5.0	0.451
0.709	0.291	4.0071	0.3530	CL 0939+4713	4.0	0.406
0.821	0.179	2.4648	0.1988	Abell 1689	2.459	0.1832
0.881	0.119	1.6386	0.1271	FRB 180814.J0422+73	1.636	0.11
0.973	0.027	0.3718	0.0274	NGC 368	0.375	0.02963

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Figure 2: Comparison of predicted redshifts using custom model versus observed galaxy redshifts.

### 2 Explanation of Table

Column 2 is 1 minus column 1, column 3 is the distance light travels through the universe, 13.8 billion light years multiplied by column 1, column 4 if the first rough estimate of the redshift. It is square root of (1+column 2)/(1-column 2) or radial redshift, Column 5 is red shift adjusted for light attenuation, column 6 is redshift adjusted for volume. Column 7 is a random galaxy to compare calculations in column 6 to real redshifts, column 8 is the time since red shifted light was emitted, and column 9 is actual redshift to compare to model redshift. Rows are removed for brevity and to provide the table on one page. Section 3's equation is used for calculating the redshift, column z, which is also column 4 in the table. are the equations for calculating the columns. The attenuation constant is 2.38 empirically.

### 3 Equation

Equation for calculating redshift throughout the universe.

$$z = \left( \left[ \frac{1+b}{1-b} \right]^{0.5} - 1 \right) e^{\frac{b^3}{2.38}}$$

### 4 Discussion and Conclusion

This model predicts z values for redshift that are remarkably close to measured values and for near, intermediate, and farthest galaxies. What is different about this model is that the red shift models seem to be related to attenuation of light. The attenuation constant is about 2.4 It may be that current models may be over predicting

attenuation. It also appears there may be some volume involvement in the redshift/z values. Column 2 is assuming that when light travels to us, it goes into the next lower dimension where the light is going from our medium at certain fraction of the speed of light into another lower dimension medium that is moving at the speed of light. The graph shows equation 1 redshift, the dots are actual galaxies. The galaxies not falling on the line are distortions in the lambdaCDM model that are not smoothed out when switching over from ordinary matter, dark matter, and dark energy dominated parts of the universe in the lambdaCDM model. This seems to be something completely ignored or not discussed about the lambdaCDM model.

Chat GPT has this to say about the light attenuation of the universe. Calculating the average attenuation is close to 2.5 while this theory uses an empirical value of 2.38, with either value being very close for predicting redshift. Although attenuation is different for each frequency.

## Attenuation of Rest-Frame UV Light Across Cosmic Time

#### Factors considered:

- Redshift (z)
- Wavelength
- Line of sight (e.g., dusty galaxies, voids)
- Type of attenuation (dust vs. hydrogen absorption)

### Step-by-Step Estimate

Let's focus on rest-frame ultraviolet (UV) light, since it's most affected by attenuation. Here's a rough picture:

#### 1. Effective Optical Depth from the IGM (Hydrogen Absorption)

For the Lyman-alpha forest, a common empirical model is:

$$\tau_{\rm eff}(z) \approx 0.0037 \, (1+z)^{3.46}$$

(from observations by Faucher-Giguère et al.)

Integrating  $\tau_{\text{eff}}(z)$  from z = 0 to z = 6 provides the cumulative attenuation for a typical UV photon.

#### 2. Dust Attenuation in Galaxies

Another component is dust in galaxies. This is harder to quantify across cosmic time, but average values are:

- $z \sim 0$ :  $\tau_{\text{dust}} \sim 0.3-0.5$  (typical)
- $z \sim 2$  (peak star formation rate):  $\tau_{\rm dust} \sim 1.5\text{--}3$

Evolution models (e.g., by Bouwens et al., 2016) suggest a peak at  $z \sim 1.5$ –2.5, then dropping at higher redshift due to lower metallicity.

So, total optical depth is:

$$\tau(z) \approx \tau_{\rm IGM}(z) + \tau_{\rm dust}(z)$$

### Simplified Approximate Calculation

Redshift Range	$ au_{ m IGM}$	$ au_{ m dust}$	$ au_{ ext{total}}$
0-1	$\sim 0.1$ – $0.3$	$\sim 0.3$	$\sim 0.5$
1 - 2	$\sim 0.5$	$\sim 1.5$	$\sim 2.0$
2-3	$\sim 1.5$	$\sim 2.0$	$\sim 3.5$
3–6	$\sim 3-6$	$\sim 0.5$	$\sim 4-6$

Weighted by volume and photon travel time, you could average this out to:

 $\langle \tau_{\rm UV, \ total} \rangle \approx 2.4 \ {\rm to} \ 3.0$ 

### **Final Answer**

An average optical depth from z = 0 to  $z \sim 6$  for UV photons would be:

$$\langle \tau \rangle \approx 2.5$$

This value:

- Is dimensionless
- Falls within your 1.5–3 target
- Represents total integrated attenuation from early universe to now
- Explains why distant galaxies appear dimmer than their intrinsic brightness

### 5 References

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