Cosmological Red Shift is a Combination of Red Shift Mechanisms

1.0 Abstract

Cosmological Redshift has typically been calculated an effect of expansion of the universe. Currently there is debate about why the Hubble constant is different depending on the method being used to calculate the Hubble constant. This paper proposes that there are at least three different contributing factors to the cosmological redshift. These are radial redshift for the acceleration of matter in the universe, transverse redshift for the spinning of the universe, and gravitational blue shift for gravitational affects on cosmological light. There are also local affects. Perhaps our area of the universe has a gravitationally bound cosmic structure, and we observe other gravitational bound. There may also be other contributions to the gravitational redshift of the universe. There may be some difficulty in calculating cosmological redshift, because we really don't know where in the universe we really are.

2.0 Formulas for Cosmological Redshift

The following are equations for the redshift of light.

Gravitational Redshift

$$[Z+1]^2 = \frac{gttreceiver}{gttsource} \quad [1]$$

Transverse Redshift

$$[Z+1]^2 = \frac{1}{1-(v/c)^2} \quad [2]$$

Radial Redshift

$$[Z+1]^2 = \frac{1+\frac{v}{c}}{1-\frac{v}{c}} \quad [3]$$

We can use these equations for calculating a distance to a source based off of the redshift of the light. The trouble with this, is that we don't know where in the universe we are. Perhaps with enough data, one could pinpoint a location in the universe. In this paper we calculate a redshift based off of various scenarios of locations in the universe.

The transverse and radial redshift are straight forward. For those it doesn't matter where one is in the universe to calculate that portion of the redshift because it is the difference in velocity between the two points. For the gravitational redshift, one has to know the structure of the universe and then calculate the gravitational field force at each point. Also, for gravitational constant one needs to know the matter distribution throughout the universe.

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In past papers we found that matter would be created from imperfections of packing in the universe. Gravity(gravitons) attempts to pull everything into a spherical form. Gravity(gravitons) on everything, while antigravity{anti-gravitons) pushes just on matter and energy.[1] Since gravity pulls everything into a spherical form, the concentration of matter is thickest at the center of the universe, and is thinnest at the edges of the universe.[2]

From here we can calculate the relative field strength of gravity. It was found that mass is related directly to the amount of imperfections in the universe. Therefore in these calculations of the relative field strength, we will use the relative amount of imperfections for the relative field strength of gravity.

The gravitational redshift in a uniform mass distribution is the following equation.

$$M(r) = \int_0^1 4\pi r^2 dr \qquad [4]$$

However, in the spinning sphere universe density decreases linearly with distance from the center of the universe. Therefor the right hand side of equation must be divided by "r". The equation then becomes

$$M(r) = \int_0^1 4\pi r dr \qquad [5]$$

As we move out to the center of the universe, there are relativistic affects on mass. Therefore we must multiply the right hand side of the equation by the Lorentz factor. Equation 5 becomes

$$M(r) = \int_0^1 \frac{4\pi r}{(1-r^2)^{.5}} dr \qquad [6]$$

If we just want to find the field strength at one particular "r" then we can change the equation to

$$M(r) = \int_0^r \frac{4\pi r}{(1-r^2)^{.5}} dr \qquad [7]$$

If we integrate the equation we are left with.

$$M(r) = -4\pi\sqrt{(1-r^2)} + constant \qquad [8]$$

3.0 Example calculation of combined redshift

For a combined redshift, one must multiply the "1+z" values. Lets propose, that our point in the universe is 0.3 fraction of the way from the center of the universe to the edge of the universe, and we are looking at something that is 0.95 fraction to the edge of the universe. For transverse and radial redshift, the difference in velocity of

the systems would be 0.65 fraction of the speed of light so these calculations are fairly simple.
Using equation 2 we find the value of Z+1 to be

Transverse Redshift

$$Z_T + 1 = \frac{1}{(1-0.65^2)^{.5}} = 1.31590...$$

Radial Redshift

$$Z_R = \sqrt{\frac{1+0.65}{1-0.65}} = 2.17124...$$

Relative Gravitational Strength of Receiver

$$M(r)_R = \int_0^{0.3} \frac{4\pi r}{\sqrt{1-r^2}} dr = 0.578817$$

Then

$$G_R = \frac{M(r)_R}{0.3^2} = \frac{0.578817}{0.3^2} = 6.4313$$

Relative Gravitational Strength of Source

$$M(r)_S = \int_0^{0.95} \frac{4\pi r}{\sqrt{1-r^2}} dr = 8.64252$$

And then

$$G_S = \frac{M(r)_S}{0.95^2} = \frac{8.64252}{0.95^2} = 9.5762$$

Gravitational Redshift

$$Z_G + 1 = \sqrt{\frac{6.4313}{9.5762}} = 0.819507$$

We can multiply the redshifts and find the total.

$$Z_{Total} + 1 = (Z_T + 1)(Z_R + 1)(Z_G + 1) = 1.31590 * 2.17124 * .819507 = 2.341441899705012$$

$$Z_{Total} = 1.34144$$

We can compare this to the Gravitational Redshift of Z+1 Radial of $Z_R + 1 = 2.17124$

$$Z_R = 1.17124$$

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5.0 Discussion

We see from section 4, that the Cosmological Redshift may be a combination of redshifts. The combination of the Redshifts are similar. There are some complicating factors. We do not know, where in the universe. We do not know if we are going at a snails pace or a peregrine falcons pace, in cosmological terms.

Another complicating factor is that we do not know if our area of the universe is in a relatively dense part. As we found out. The universe is not uniformly observed density at small scales.

If one looks at the equations, one will find that that as the receiver moves towards the center of the universe, there is little affect from the gravitational redshift, which is actually a blue shift contribution in our example. As the receiver moves towards the edge of the universe, the gravitational blue shift has a bigger contribution.

Also notice that the gravitational contribution can be a redshift or blue shift depending if the receiver or source is closer or farther from the center of the universe.

In the particular example that we used, the transverse and radial redshifts would remain the same, but

$$Z_G + 1 = \sqrt{\frac{9.5762}{6.4313}} = 1.22025$$

And

$$Z_{Total} + 1 = (Z_T + 1)(Z_R + 1)(Z_G + 1) = 1.31590 * 2.17124 * 1.22025 = 3.486418637199$$

The result is quite a bit different. And should help determine where in the universe we are.

6.0 References

1.) http://vixra.org/pdf/1911.0526v1.pdf
2.) http://vixra.org/pdf/1407.0183v3.pdf