

Frequency Decay Through Electromagnetic Radiation Absorption and re-Emission by Inter-Galactic Dark Matter as an Alternate Explanation For the Hubble Constant

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1.0 Introduction/Abstract

Presently, the decreasing frequency of Electromagnetic radiation from Galactic/Cluster objects as their distance from the Milky Way [MW] increases is taken as an absolute declaration of their motion away from the Solar system. The decay rate defined by the Hubble constant is so miniscule, it is reasonable to propose that frequency reduction of the signal could be due to interfering effect of inter-Galactic gases as an alternate explanation. It also reasons that if the objects on the edge of the Universe (an example being the UDFj-39546284 stellar structure at 13.423 Billion light years) were receding at the velocity reasoned from their Redshift, any EM signal would be moving more slowly, because of Relativistic effects. This paper determines the rate of frequency decay in an inter-Galactic scale environment. It also argues against the velocity of Universe expansion demanded by the Big Bang theory, given the currently accepted time for that event, and the time for the signals from the observed objects to move between the objects and our observation points.

An alternate cause for the EM frequency shifts downward would be the Dark Matter throughout the Universe. A simple parallel to the reddening of solar radiation as it travels through a greater thickness of the atmosphere during both Sunrise and sunset.

Support for this alternate supposition is that in current Hubble Theory, the M31 Galaxy and the NGC 300 Galaxy are at distances inconsistent with their recession velocity.

2.0 Calculated Decay Rate of Inter-Galactic Radiation in Metres

The widely accepted values used for the following calculations are presumed (in logic terms) exact to five decimal places. An accuracy of five decimal places is unjustified in a number of instances. But they are only illustrative presumptions; the thesis of this paper does not rely on exact values. Mass of the Universe is a debated issue; this paper will assume a mass of $1.0E52\text{Kg}$ in the matter and $1.0E53\text{kg}$ in Energy, for a total of $1.1E053\text{kg}$. There is also no absolute agreement on a value for the age of the Universe. This writer simply chose a central value from estimations of varied sources – with the intent to argue how all of those estimations are invalid.

$$\text{Universe}_{\text{Mass}} = 1.10000E+53\text{kg}$$

$$\text{Universe}_{\text{Age}} = 13.8 \text{ Billion years}^{\text{a}} || 1.38000E+10\text{yrs}$$

$$\text{Pi} = 3.14159E0$$

$$\text{Planck}_{\text{Length}} = 1.61620E-35^{\text{b}}$$

$$c = 299\,792\,458\text{m/s}$$

$$\text{Distance}_{\text{LY}} = 9.46073E+15\text{m}^{\text{c}}$$

$$\text{Distance}_{\text{pc}} = 3.08568E16+16\text{m}^{\text{d}}$$

$$\text{Hubble}_{\text{Constant}} = 69.32(\text{km/s})/\text{Mpc}^{\text{e}}$$

$$\text{Hubble}_{\text{Constant}_{\text{m/s}}} = 69.32 * 10^3 = 6.932E+4(\text{m/s})/\text{Mpc}$$

$$\text{Graviational}_{\text{Constant}} = 6.673\,84E-11\text{m}^3/(\text{kgs}^2)^{\text{f}}$$

^a J.D. Harrington “Planck Mission Brings Universe into Sharp Focus” NASA News Releases, http://www.nasa.gov/home/hqnews/2013/mar/HQ_13-079_Planck_Mission.html

^b The NIST Reference on Constants, Units, and Uncertainty Fundamental Physics Constants, Plank Length, l_{Planck} <http://physics.nist.gov/cgi-bin/cuu/Value?plkl>

^c “The NIST Guide for the use of the International System of Units” National Institute of Standards and Technology, <http://physics.nist.gov/Pubs/SP811/appenB9.html>

^d Ibid.

^e “Nine-Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Final Maps and Results” <http://arxiv.org/pdf/1212.5225v3.pdf>.

^f NIST Reference, Ibid, http://physics.nist.gov/cgi-bin/cuu/Value?bg|search_for=gravity

The farthest object in the Universe is currently agreed to be the UDFj-39546284^g compact Galaxy. The observed redshift of UDFj-39546284 indicates its distance is 1.32000E10^h LY||4.0164829100E3 Mpc [UDFj-39546284_{Distance_LY}]. For objects at the 12 – 13 billion LY range, reasoning the distance from its redshift is not an invariable, absolute, unchallenged value. But this paper will simply accept it for use in establishing a theoretical principle.

So let us calculate the Relativistic consequences were that object on the “boundary” of the Universe, to theoretically calculate the volume of the Visible||Local Universe at an instant that has long passed. Objects farther on would add to the arguments this paper makes, not contest them. This paper will start by calculating its distance in meters [UDFj-39546284_{Distance_m}].

$$\text{UDFj-39546284}_{\text{Distance}_m} = \text{UDFj-39546284}_{\text{Distance}_{LY}} * \text{Distance}_{LY}$$

$$\text{UDFj-39546284}_{\text{Distance}_m} = 1.32000\text{E}10\text{ly} * 9.46073\text{E}15\text{m/ly}$$

$$\text{UDFj-39546284}_{\text{Distance}_m} = 1.24882\text{E}26\text{m}$$

The Universe Volume under those presumptions would be:

$$\text{Universe}_{\text{Volume}} = 4/3 * \pi * (\text{UDFj-39546284}_{\text{Distance}_m})^3$$

$$\text{Universe}_{\text{Volume}} = 4/3 * 3.14159\text{E}0 * (1.24882\text{E}26\text{m})^3$$

$$\text{Universe}_{\text{Volume}} = 8.15801\text{E}78\text{m}^3$$

The Universe Energy/Matter density at that moment would be:

$$\text{Energy||Matter}_{\text{Density}} = \text{Universe}_{\text{Mass}} / \text{Universe}_{\text{Volume}} \tag{3}$$

$$\text{Energy||Matter}_{\text{Density}} = 1.10000\text{E}+53\text{kg} / 8.15801\text{E}78\text{m}^3$$

$$\text{Energy||Matter}_{\text{Density}} = 1.34837\text{E}-26\text{kg/m}^3$$

At that density, it is presumed that light moves at |c|. The light speed limit is one of the most fundamental tenets of Science. If any EM we observe had not moved here at a maximum of light

^g “Hubble finds a new contender for galaxy distance record”, Hubble European Space Agency <http://www.spacetelescope.org/news/heic1103/>

^h Ibid.

speed, then most of Relativity, most of modern Physics and its constants would have to be thrown out. Even General Relativity relies on a “c” in combination with a Planck level value – the Gravitational Constant [G]. So the minimum time in seconds the light signal took to return [Signal_{Return}] would be the Distance of UDFj-39546284 in metres divided by c:

$$\begin{aligned} \text{Signal}_{\text{Return}} &= \text{UDFj-39546284}_{\text{Distance}_m} / c && (4) \\ \text{Signal}_{\text{Return}} &= 1.23936\text{E}26\text{m} / 299\,792\,458\text{m/s} \\ \text{Signal}_{\text{Return}} &= 4.13405\text{E}17\text{s} \end{aligned}$$

The time in years UDFj-39546284 had to move out [UDFj-39546284_{Time_Outward_Years}] would be the presumed age of the Universe, less the time it took for the signal to return.

$$\begin{aligned} \text{UDFj-39546284}_{\text{Time_Outward_Years}} &= \text{Universe}_{\text{Age}} - \text{Signal}_{\text{Return}} && (5) \\ \text{UDFj-39546284}_{\text{Time_Outward_Years}} &= 1.38000\text{E}+10\text{years} - 1.32000\text{E}+10\text{years} \\ \text{UDFj-39546284}_{\text{Time_Outward_Years}} &= 6.00000\text{E}+8\text{years} \end{aligned}$$

That time in seconds

$$\begin{aligned} \text{Year}_{\text{Seconds}} &= 365.25 * 24 * 60 * 60 \\ \text{Year}_{\text{Seconds}} &= 3.15576\text{E}7\text{s/yr} \\ \text{UDFj-39546284}_{\text{Time_Outward_Seconds}} &= \text{Year}_{\text{Seconds}} * \text{UDFj-39546284}_{\text{Time_Outward_Years}} && (6) \\ \text{UDFj-39546284}_{\text{Time_Outward_Seconds}} &= (3.15576\text{E}7\text{s/yr}) * 6.00000\text{E}+8\text{yr} \\ \text{UDFj-39546284}_{\text{Time_Outward_Seconds}} &= 1.89346\text{E}16\text{s} \end{aligned}$$

So the average velocity the UDFj-39546284 object moved out at would be

$$\begin{aligned} \text{UDFj-39546284}_{\text{Velocity_Outward}} &= \text{UDFj-39546284}_{\text{Distance_m}} / \text{UDFj-39546284}_{\text{Time_Outward_Seconds}} & (7) \\ \text{UDFj-39546284}_{\text{Velocity_Outward}} &= 1.23488\text{E}26\text{m} / 1.89346\text{E}16\text{s} \\ \text{UDFj-39546284}_{\text{Velocity_Outward}} &= 6.59543\text{E}9\text{m/s} \end{aligned}$$

As a multiple of light speed that velocity would be:

$$\begin{aligned} \text{c_multiple}_{\text{Outward}} &= \text{UDFj-39546284}_{\text{Velocity_Outward}} / c & (8) \\ \text{c_multiple}_{\text{Outward}} &= (6.59543\text{E}9\text{m/s}) / 2.99792\text{E}8\text{m/s} \\ \text{c_multiple}_{\text{Outward}} &= 2.20000\text{E}1 \end{aligned}$$

In some camps, the above distance would be contested, somehow ascribing half (or more) of the visual aspect of UDFj-39546284 to a stretching in space that has taken place. But even if half of that velocity ascription were true, the $\text{c_multiple}_{\text{Outward}}$ value would be 1.10000E1 – assigning both the motion/expansion of UDFj-3956284 and the returning signal to that speed. But then the question that would need to be answered would be: Why has the velocity of the object dropped below light speed now just as we develop the technology to observe it? It can be argued that the stretching space phenomenon would distort the image of an object withdrawing because of the stretched space, but if it distorted the image of an object, it would distort the frequency as well. We would actually observe UDFj-3956284 with a frequency distortion of a 22*c velocity. It is completely unreasonable to suppose that any stretching space phenomenon would not stretch/shift the signal contained in space; there by showing it was moving faster than “c”. So the complete postulate now is this: in the beginning of the Universe, its space expanded at a hyper-light velocity. The farthest currently observed object whose velocity/expansion factor has slowed down to just as we observe it to below light speed, will soon increase to beyond “c” to an infinitely expanding Universe. That is not a logical line of reasoning.

The Density of the Universe at its inception (the “Cosmic Egg”) can be theorized to be a volume of a sphere with the diameter of a Planck_{Length}. That diameter is not a declaration of fact/reality; the radius may be the more legitimate value. But the scale of difference in volume between the two makes either a valid theoretical presumption:

$$\text{Volume}_{\text{Cosmic_Egg}} = 4/3 * \pi * (\text{Planck}_{\text{Length}} / 2)^3 \quad (9)$$

$$\text{Volume}_{\text{Cosmic_Egg}} = 4/3 * 3.14159 * (1.6162\text{E-}35\text{m}/2)^3$$

$$\text{Volume}_{\text{Cosmic_Egg}} = 2.21046\text{E-}105\text{m}^3$$

Divide that into its entire mass:

$$\text{Density}_{\text{Cosmic_Egg}} = \text{Mass}_{\text{Universe}} / \text{Volume}_{\text{Cosmic_Egg}} \quad (10)$$

$$\text{Density}_{\text{Cosmic_Egg}} = 1.100\sim 00\text{E+}53\text{kg} / 2.21046\text{E-}105\text{m}^3$$

$$\text{Density}_{\text{Cosmic_Egg}} = 4.97633\text{E}157\text{kg}/\text{m}^3$$

So what current Science is arguing is that the Universe expanded at an average rate of 6.59543E9m/s – again, approximately 22*c. Expanding at that rate through densities ranging from 4.97633E157 kg/m³ to 1.37948E-26 kg/m³. Then slowing down at the moment it reached the distance of our farthest observed body UDFj-39546284 to a velocity just below that of light speed.

Even that is not the fundamental failing of current theory. There are no theories that propose how the beginning of the Universe ever formed – who/what laid the Cosmic Egg? If a fundamental in any theory of is that an aspect of it is absolutely indeterminate, how valid is that theory?

It is admitted that the object at a distance the UDFj-39546284 scale appears to be somehow beginning, infant Galactic object. But it should be remembered that the EM decay defined by the Hubble constant would eventually have a distortive effect on the signal.

An item brought up in a Science article written soon after the body's discovery supports this notion: "The primordial galaxy that they found is so remote that its light is detectable only at the longest infrared wavelengths that Hubble can see"ⁱ. It is unreasonable to assert that when there are limits to the EM you observe of an object, that you see an absolutely true image of the object.

ⁱ "Oldest galaxy is lone ranger", Nature, International Weekly Journal of Science, doi:10.1038/news.2011.47, <http://www.nature.com/news/2011/110126/full/news.2011.47.html>

3.0 Relativistically Slowed EM/Boson Transmission

The returning signal from objects “on the edge of the Local Universe” would not be moving at light speed. If the Universe were expanding or the objects are simply moving out at high Relativistic velocity, that would mean that the signal (under current theory) would be moving at a slower pace than it would were there no relativistic distortion. The same holds true of expansion, though the signal velocity would not be decreasing on an asymptotic curve (as it would under the $|(1 - v^2/c^2)^{1/2}|$ expression) but a directly linear depression. This would be because while at any single point (or a distance that could experimentally confirmed) the velocity would be measured as “c”. But expansion would increase the distance the signal had to travel. That would be if it were possible to measure the velocity between two independent Galactic scale objects – objects that were not gravitationally “wedded” as is the Milk Way/Andromeda pair. It is also unreasonable to suppose that the expansion would increase the velocity. From an experimental viewpoint if a signal were released, if you added the distance travelled to the distance defined in the experiment, logically, the signal would have travelled a greater distance, but from the perspective of the experimenters the distance would be exactly as it would be were the object not moving. It would take longer than 13.8 Billion years for a slowed EM signal to travel 13.2 Billion light years.

The object Hubble constant was updated in a recently released paper: Planck 2013 Results. Overview of Products and Scientific Results. It cited the value to be:

$$H = (67.8 \pm 0.77) [\text{km/s}]/\text{Mpc}^j$$

The UDFj-39546284 is cited to have existed just 380 million years after the Big Bang^k. The distance in meters of the UDFj-39546284 object is cited to be: 1.24882E26m. The space between

^j Planck 2013 Results. Overview of Products and Scientific Results <http://arxiv.org/find/astro-ph/1/au:+Collaboration+Planck/0/1/0/all/0/1>; <http://arxiv.org/abs/1407.6663>

^k Ancient Galaxy may be the most Distant Ever Seen, SPACE.com, Mike Wall, <http://www.space.com/18879-hubble-most-distant-galaxy.html>

here and the UDFj-39546284 object is so disperse we can presume that the signal travelled here at light speed. There is certainly no reason to believe that it travelled any faster than light speed. The Hubble recession would also mean that there would be a Relativistic slowdown of the signal. While current thinking is that the redshift is because of Space expansion that would have the same effect on the speed on transmission. Even if the signal were travelling at an undistorted speed, the expansion of space in front of that signal would mean that it had to travel a greater distance. The logic of that could be contested, putting forward the notion that the space expansion distorts the signal so that while it was released from a much closer position, it appears to be farther away. But even if that argument nulls the additional distance the object is now at because of Space expansion, that expansion would increase the distance that the EM signal had to travel – and so it would take the 13.2 Billion years to travel to our observation point. So simply assume that the signal travelled 1.24882E26m. Presuming the Hubble shift to be the value cited earlier, for and for a theoretic supposition, exactly 67.8[km/s]/Mpc

$$\text{Distance}_{\text{Parsec}} = 3.0856776\text{E}16\text{m}/\text{Parsec} \quad (11)$$

$$\text{Distance}_{\text{UDFj-39546284_Parsecs}} = 1.24882\text{E}26\text{m}/(3.0856776\text{E}16\text{m}/\text{Parsec})$$

$$\text{Distance}_{\text{UDFj-39546284_Parsecs}} = 4.04597\text{E}9\text{Parsec}$$

$$\text{Distance}_{\text{UDFj-39546284_Mega_Parsecs}} = 4.04597\text{E}9\text{Parsec}/1000 \quad (12)$$

$$\text{Distance}_{\text{UDFj-39546284_Mega_Parsecs}} = 4.04597\text{E}6\text{Mpc}$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284}} = \text{Distance}_{\text{UDFj-39546284_Mega_Parsecs}}/H \quad (13)$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284}} = 4.04597\text{E}6\text{Mpc} * 67.8[\text{km/s}]/\text{Mpc}$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284}} = 2.74317\text{E}8\text{km/s}$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284_m/s}} = (2.74317\text{E}8\text{km/s})*(1000\text{m}/\text{km}) \quad (14)$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284_m/s}} = 2.74317\text{E}11\text{m/s}$$

Now presume that the object is simply travelling at the velocity its Hubble shift would lead it to be. Again, it exceeds the speed of light:

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284_c_multiple}} = \text{Withdrawl_Velocity}_{\text{UDFj-39546284_m/s}}/c \quad (15)$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284_c_multiple}} = 2.74317\text{E}11\text{m/s} / 2.99792\text{E}8\text{m/s}$$

$$\text{Withdrawl_Velocity}_{\text{UDFj-39546284_c_multiple}} = 9.15022\text{E}2$$

So by two arguments, by current physics presumptions, the UDFj-3956284 object is moving faster than the speed of light in an extremely vacuous environment. It is more or less established that EM signals move at the velocity of “c”, 299 792 458m/s in a vacuum environment. Current observations directly contradict this fundamental in modern science. Is it possible that the Hubble Shift is being misinterpreted? Or, alternately, that the Universe is much older than 13.8 Billion years?

An alternate explanation could be that the speed the objects are moving is distorting the Red Shift on the signal. There are equations in another paper on this site that will convert that velocity to a “Real” or “non-Relativistic” velocity: **The Relativistic Space-Time Perspective**¹. The appropriate equation is the velocity conversion equation, defined by the variables [SRPD is an acronym for Special Relativistic Perspective Distortion]:

$\text{Time}_{\text{noSRPD}}$ - Relativistic/SRPD seconds passing from an SRPD viewpoint when that viewpoint is under no other distortion – the inverse parallel to the |Time| variable.

$\text{Time}_{\text{SRPD}}$ - Relativistic||SRPD seconds dependant on the velocity and the distortion it creates from an SRPD viewpoint.

$\text{Velocity}_{\text{noSRPD}}$ - undistorted velocity measured from a SRPD viewpoint with a zero distortion factor.

SRPD variables are variables from the perspective of a Relativistically distorted viewpoint. When there is no distortion, no velocity, a Relativistic second will take exactly as long as an un-distorted non-Relativistic second. When there is distortion, fewer Relativistic seconds elapse. It is the inverse of the Classic Einsteinien definition of Relativistic distortion. So the equation would be:

¹ The Relativistic Space-Time Perspective, D.G. Taylor, <http://vixra.org/abs/1306.0104>

$$\text{Time}_{\text{SRPD}} = \text{Time}_{\text{noSRPD}} * (1 - \text{Velocity}_{\text{noSRPD}}^2 / c^2)^{1/2}$$

Beginning with the above, an equation is reasoned that argues that the velocity perceived from the viewpoint of a distorted object will be distorted in exactly the same fashion as the Length, Time & Mass.

But the distortion would be somewhat more complex than that. While Bosons will be slowed by the distortions and lose energy/mass, all matter particles/objects would gain mass. It is unreasonable to postulate that if energy at the quantum level declines and the mass of matter at the same quantum level increases there will be a simple slowdown in the passage of time. While the Relativistic Velocity can be used as a “presumed ideal” in reasoning other equations (that is gone into in much more detail in **The Relativistic Space-Time Perspective**) it is unreasonable to suggest that if the ratios of mass change between Matter particles and Boson particles that they will interact exactly as they do in an undistorted state, simply at a slower pace. We know that between elements the average mass of nucleons & leptons changes, and those changes would have to alter the way they interact, both chemically and atomically.

So it is unreasonable to suggest that the only possible cause of the Hubble Constant is Universe expansion. That is NOT the only cause of observed frequency shift. While simple EM passages through a medium will redshift the wavelength, that would only be true if the energy reduction of the signal were minimal – i.e. the medium through which it passed was of minimal extent and density. Were a signal were interrupted (eventually) by an aspect of that medium, a new signal would be generated. Part of the signal would raise the temperature whatever particle of the medium it collided with. That particle would generate another signal, but at a lower frequency because of the energy absorption. That supposition is examined to greater extent in the following section.

4.0 EM absorption by Inter-Galactic Gases/Matter

There is hard evidence of the existence of Dark Matter throughout our reality – that evidence being the EM frequency shifts downward. In a simple parallel to the reddening of solar radiation as, it travels through a greater thickness of the atmosphere during both Sunrise and sunset, absorption by the simple oxygen/nitrogen atoms. They do absorb some of that radiation and increase their molecular/atomic level velocity then emit new photons, photons with a tiny reduction in their frequency.

Intergalactic spatial Matter may contribute to the Red Shift observed in inter-Galactic distances. That factor is in a number of technical and non-technical publications. A summary of those publications made in the NASA home site in “NASA's Hubble Confirms That Galaxies Are the Ultimate Recyclers”^m:

Astronomers believe that the color and shape of a galaxy is largely controlled by gas flowing through an extended halo around it. The three studies investigated different aspects of the gas-recycling phenomenon.

The above article effectively argues against inter-galactic space being a simple and absolute vacuum. Though that absolute is unargued, it is an important assumption in an alternate explanation for the Hubble constant. An inevitable consequence of any EM signal passing through disperse gas is the frequency shift because of signal transmission through any medium. It is unreasonable to suggest that the mass of Galactic|Sub-Galactic [G|SG] disperse matter simply ends at the “Halos” surrounding them. The Hubble telescope produced a “halo of gas is shown with a radius of about 300,000 light years, although it may extend significantly further”ⁿ – significantly further than the one that is reasoned to surround the MW.

There would also be a much more disperse overwhelmingly Hydrogen element atmosphere universally. So without inventing an imaginary “Ether” substance, simply proposing a very

^m Hubble Space Telescope Site; “NASA's Hubble Confirms That Galaxies Are the Ultimate Recyclers”, http://www.nasa.gov/mission_pages/hubble/science/recyclers.html

ⁿ Hubble Space Telescope Site; “Chandra: The Milky Way’s Hot Gas Halo”, http://www.nasa.gov/mission_pages/chandra/multimedia/hot_gas_halo.html

definable aspect of inter-Galactic space: a Hydrogen Cosmosphere throughout Space/Reality. The gravity of G|SG objects would never be strong enough or direct enough for permanent capture of all of that Cosmosphere. There is a titanic variation in the mass and breadth in all cosmic objects. There is universal variation in the rate & vectors of the movement of those objects.

Finally, the simple growth and evolution of all Stellar/cluster/galactic formation is an ongoing process throughout the Universe as is argued in a very broad range of publications and articles/essays. There are so many of them, it would seem prejudicial to quote only one. Any reader of this article is invited to simply go to Google and type in “spontaneous galactic formation publications”. The details of how those formations would come about are argued, but ongoing Galactic formation is not. That would mean effectively that matter is everywhere. We are only able to observe that matter becomes concentrated enough to substantially generate, divert or reflect/absorb EM in a substantial enough fashion that it be visible from hundreds, thousands, or millions of Parsecs away. Though its density can be debated endlessly. Its temperature is cited as in the same article:

Other studies have shown that the Milky Way and other galaxies are embedded in warm gas, with temperatures between 100,000 and one million degrees, and there have been indications that a hotter component with a temperature greater than a million degrees is also present.^o

- But its existence can be declared as an absolute. It also offers a proposal for an additional component to CMBR: matter in the form of a superheated interstellar||intergalactic gas, at a temperature of a million degrees. That gas permeates throughout the upper atmosphere of our planet. At a very low magnitude, it transfers its energy to Earth’s atmosphere. It will eventually get to the point that both the magnitude and the extremely low frequency of the signal means that it more or less stabilizes at that value – the CMBR. In the course of its frequency decline, that would also mean that it would also diffract (a currently incalculable) amount.

It is surely a more reasonable supposition to make that deduction from current observations than to invent a dark energy from evidence millions/billions of light years/parsecs away. The

^o Hubble Space Telescope Site; Ibid.

collective EM radiation from the entire Universe would be extremely dispersed. It would be the simple radiation from the dark matter/Cosmosphere, in an environment just short of the vacuum absolute. So it is argued that the CMBR is not a leftover from the Big Bang but a simple demonstration of the “temperature” of our reality.

Radiation from the entire Cosmos travels through the extremely disperse Cosmosphere of our Local Universe. As each photon collides with individual matter particles of all sizes, it will have the effect of increasing the velocity of that particle. A new Photon will emerge at a lesser frequency and intensity. The collective action of all free particles in a given density would then lead to a relatively smooth radiation – the level of that radiation determined by the collective EM sources surrounding any point.

There is also the simple fact that the CMBR we observe is only the CMBR level in the limited expanse of our immediate Space||Time region. It is not reasonable to assert that level is the same in all of reality, simply because it is a moderately homogenous level from an infinitesimal viewing point in our Local Universe (our planet; our Solar system) with observations made over a comparably limited time period. That inter-galactic Cosmosphere would also have the effect of putting a tiny red shift on the parent signal. At a particularly tiny quantum level for each exchange, but the effect would accumulate at the Parsec, the Mega-Parsec level. The current value for the CMBR was reported in The Astrophysical Journal:

The FIRAS data are independently recalibrated using the WMAP data to obtain a CMB temperature of 2.7260 ± 0.0013 . Measurements of the temperature of the cosmic microwave background are reviewed. The determination from the measurements from the literature is cosmic microwave background temperature of 2.72548 ± 0.00057 Kp.

There was additional evidence for this supposition recently: The Boomerang Nebula: The Coldest Region of the Universe?[¶]. The Nebula was observed to be within a cosmologically crisp one degree Kelvin. While the expansion of the gas would cool it, it would also greatly expand its exposure to the CMBR. The nebula is presumed to be at a pre-planetary stage. So the centre point of the Nebula would be its densest and warmest part of the body. There would also be the continual input of the core itself. It is not a gas expansion happening in carefully structured and blocked cooling pipes; it is happening in an area surrounded by EM radiation from both within and without. There is also the simple temperature maintenance structure that the CMBR represents. If the CMBR is the Universal phenomenon it is touted to be, the Boomerang Nebula could never descend to its present temperature. It would cool to the point where it was the same temperature as the surrounding environment. It is arguable that the CMBR is not of a great enough magnitude to “re-heat” any cooled object. But surely it is unreasonable to suppose that any mass of matter would lose more energy as it compressed such that its temperature would fall below the ambient temperature around it. Objects heat up as they compress – if that fundamental is denied, then almost all theory of stellar/Galactic formation would have to be dismissed.

¶ Raghvendra Sahai and Lars-Åke Nyman; “The Boomerang Nebula: The Coldest Region of the Universe?” *The Astrophysical Journal*, Volume 707, Issue 2, pp. 916-920 (2009)
<http://iopscience.iop.org/1538-4357/487/2/L155/>

5.0 Inconsistent Galactic Velocities

There is also this to consider: the Andromeda Galaxy [M31] is currently estimated to have a distance of 7.85×10^6 kiloparsec^r (7.85×10^{-1} Mpc [M31_Distance_{Parsec}] or 2.56×10^6 ly [M31_Distance_{LY}]). Using the already cited Hubble_{Constant_{km/s}}, its recession velocity [M31_Recession_{Velocity}] should be:

$$M31_Recession_{Velocity} = M31_Distance_{Parsec} * Hubble_{Constant_{km/s}} \quad (16)$$

$$M31_Recession_{Velocity} = 69.32(\text{km/s)/Mps}) * 7.85 \times 10^6 \text{ Mps}$$

$$M31_Recession_{Velocity} = 5.8(\text{km/s})$$

The actual velocity of M31 is considerably more in an opposite vector: 301 ± 1 km/s^s [M31_{Velocity}] towards the MW. There could be an argument made that the two bodies had some separating velocity in the early moments of the Universe, but for this simple fact. The mass of M31 is thought to be more or less equivalent to that of the MW, that of 1.0×10^{12} Solar Masses^t.

As the mass of the Sun [Mass_{Sun}] is widely estimated to be 1.0×10^{30} kg^u, that would mean both Galaxies massed:

$$Mass_{MW} = Mass_{Sun} * MW_{Solar_Masses} \quad (17)$$

$$Mass_{MW} = 1.0 \times 10^{30} * 1.0 \times 10^{12}$$

$$Mass_{MW} = 1.0 \times 10^{42} \text{ kg}$$

^r A. W. McConnachie, M. J. Irwin, A. M. N. Ferguson, R. A. Ibata, G. F. Lewis, N. Tanvir "Distances and Metallicities for 17 Local Group Galaxies"; Monthly Notices Royal Astronomical Society. 356:979-997, 2005;

<http://mnras.oxfordjournals.org/content/356/3/979.full?sid=1a570508-7670-42a8-af78-b4879a80e7cb>

^s Karachentsev, I. D.; Kashibadze, O. G. (2006). "Masses of the local group and of the M81 group estimated from distortions in the local velocity field". *Astrophysics* **49** (1): 3–18.

Bibcode:2006Ap....49....3K. doi:10.1007/s10511-006-0002-6.

^t Karachentsev, I. D.; Kashibadze, O. G. Ibid.

^u Dr. David R. Williams, "Sun Fact Sheet"

<http://nssdc.gsfc.nasa.gov/planetary/factsheet/sunfact.html>

Since the distance of M31 is 2.56E6ly, and the LY distance is 9.46073 04726E+15m that would mean the distance in metres between M31 and the MW would be:

$$\begin{aligned} \text{Distance_M31}_{\text{Metres}} &= \text{Distance}_{\text{LY}} * \text{Distance_M31_LY} & (18) \\ \text{Distance_M31}_{\text{Metres}} &= 9.46073\text{E}+15\text{m/ly} * 2.56\text{E}+6\text{ly} \\ \text{Distance_M31}_{\text{Metres}} &= 2.42194\text{E}22\text{m} \end{aligned}$$

So the Escape velocity between the two bodies would be:

$$\begin{aligned} \text{Escape}_{\text{MW}} &= (2 * G * \text{Mass}_{\text{MW}} / \text{Distance_M31}_{\text{Metres}})^{0.5} & (19) \\ \text{Escape}_{\text{MW}} &= (2 * 6.67384\text{E}-11 * 1.0\text{E}36\text{kg} / 2.42194\text{E}22\text{m})^{0.5} \\ \text{Escape}_{\text{MW}} &= 1.17056\text{E}5\text{m/s.} \end{aligned}$$

- And the proportion of the actual velocity to escape velocity would be

$$\begin{aligned} \text{Proportion}_{\text{Escape_Velocity}} &= \text{Escape}_{\text{MW}} / \text{M31}_{\text{Velocity}} & (20) \\ \text{Proportion}_{\text{Escape_Velocity}} &= 3.01000\text{E}5\text{m/s} / 1.17056\text{E}5\text{m/s} \\ \text{Proportion}_{\text{Escape_Velocity}} &= 2.57142\text{E}0 \end{aligned}$$

So M31 is approaching the MW at more than 2½ times their mutual escape velocity, in an “expanding” Universe. The escape velocity would be even less than the above since distance used for the escape equation above is even greater; the distance referred to is the distance between both objects centre of gravity. But both objects are so disperse, that the centre of gravity is a debatable issue. The above is the absolute maximum escape velocity; they may be mutually approaching at a much greater proportion. Is that not another argument for frequency decay because of the Local Universe Cosmosphere as an explanation as opposed to a Hubble Reality? M31 is simply moving towards us at a velocity too high to be overcome by Cosmosphere frequency shift.

This paper will not speculate as to the true age of the Universe. Later papers will examine that age. But a minimum age for the Universe can be proposed. The first question is when did the

density of the Universe reach the point where a hyper-light velocity is no longer reasonable. That point is neither in current theory or available from the objections made in this paper.

But let us propose that the reason that the M31 body is approaching us and not receding is that it rests at the limit of how far there could be spontaneous expansion. So what would the density of a homogenous sphere with containing the entire assumed matter/energy mass of the Universe – a sphere with a radius equal to the distance between the MW and M31? Because M31 is approaching the MW now, it would have been farther away at the time. Volume of that sphere would be:

$$\text{Volume}_{\text{MW||M31_Sphere}} = 4/3 * 3.14159 * (\text{Distance_M31}_{\text{Metres}})^3 \quad (21)$$

$$\text{Volume}_{\text{MW||M31_Sphere}} = 4/3 * 3.14159 * (2.4219470010\text{E}22\text{m})^3$$

$$\text{Volume}_{\text{MW||M31_Sphere}} = 2.83761\text{E}67\text{m}^3$$

So the density of such a sphere would then be the Mass of the Universe ($\text{Universe}_{\text{Mass}}$) divided by the volume of the Sphere.

$$\text{Density}_{\text{MW||M31_Sphere}} = \text{Universe}_{\text{Mass}} / \text{Volume}_{\text{MW||M31_Sphere}} \quad (22)$$

$$\text{Density}_{\text{MW||M31_Sphere}} = 1.10000\text{E}+53\text{kg} / 2.83761\text{E}67\text{m}^3$$

$$\text{Density}_{\text{MW||M31_Sphere}} = 3.52409\text{E}-15 \text{ kg/m}^3$$

And its gravity:

$$\text{Gravity}_{\text{MW||M31_Sphere}} = \text{GraviationalConstant} * \text{Mass}_{\text{Universe}} / (\text{Distance_M31}_{\text{Metres}})^2 \quad (23)$$

$$\text{Gravity}_{\text{MW||M31_Sphere}} = 6.673 \text{E}-11\text{m}^3/(\text{kgs}^2) * 1.10000\text{E}+53\text{kg} / (2.421947\text{E}22\text{m})^2$$

$$\text{Gravity}_{\text{MW||M31_Sphere}} = 1.864088\text{E}-3\text{m/s}^2$$

Surely it is unreasonable to suppose that a sphere with a density of $3.52409\text{E}-15 \text{ kg/m}^3$ and a Gravity of $1.864088\text{E}-3\text{m/s}^2$ would be sufficient to force Hyper-EM velocity expansion of the Universe.

Presume for simplicities sake, it took 3.8 Billion years for the Milky Way||M31 group to form. Also presuming the average velocity to be one-half what it is now – to calculate arithmetically would be possible, but that would require knowledge of the distorting effects of all secondary, tertiary, quaternary, et.al. bodies in the MW||M31 Cluster.

Finally, presume the initial approaching velocity ($M31_{Average_Approach_Velocity}$) to be half what we observe it to be now. The position of M31 with relation to MW would be its current position now, but the distance it has travelled in the past 10 Billion years. “Escape velocity” is not the maximum velocity that could be imposed on an approaching object. Escape velocity is where the kinetic energy of an object were it launched is equal to the potential energy of an object were it at an infinite distance – the definition presumes that the end velocity to be zero. A projectile object moving at well beyond escape velocity will still have its outward velocity lessened by gravity. But its outward velocity would not be Parabolic; it would be Hyperbolic – never decreasing to zero. In parallel, the velocity of projectile object approaching a gravitational body would be determined by its approaching velocity as well as the velocity imposed by the gravity of the object. Gravitational acceleration would not cease until the approaching body reached light speed.

$$M31_{Average_Approach_Velocity} = M31_{RecessionVelocity} / 2 \quad (24)$$

$$M31_{Average_Approach_Velocity} = (3.0100E5m/s)/2$$

$$M31_{Average_Approach_Velocity} = 1.50500m/s$$

Its distance ten Billion years ago would be that velocity distance added to its current distance:

$$\begin{aligned} \text{Distance_M31}_{10_Billion_Years_Ago} &= \text{Distance_M31}_{Metres} + (1.0E7\text{Years} * \text{YearSeconds} * \sim \\ & * M31_{Average_Approach_Velocity}) \end{aligned} \quad (25)$$

$$\text{Distance_M31}_{10_Billion_Years_Ago} = 2.42194E22m + (1.0E7 * 3.15576E7s/yr * 1.50500m/s)$$

$$\text{Distance_M31}_{10_Billion_Years_Ago} = 6.64156E22m$$

That same distance in light years

$$\text{Distance_M31}_{10\text{Billion_Years_Ago_LY}} = \text{Distance_M31}_{10\text{Billion_Years_Ago}} / \text{Distance}_{LY} \quad (26)$$

$$\text{Distance_M31}_{10\text{Billion_Years_Ago_LY}} = 6.64156E22\text{m} / 9.46073E+15\text{m/LY}$$

$$\text{Distance_M31}_{10\text{Billion_Years_Ago_LY}} = 7.02014E6LY$$

There is a Galaxy at approximately that distance: NGC 300. Its distance now is $6.85E+6LY$ [2.1Mpc^v]. Its Redshift is what it would be for an object moving at $1.45E5\text{m/s}$. That velocity is less than half of M31, but in an absolutely opposite vector. That would mean that 10 Billion years ago, M31 was at the approximate distance of NGC 300. The distance of NGC_300 in metres now is

$$\text{Distance_NGC300}_{\text{Metres}} = \text{Distance_NGC300}_{\text{Metres}} * \text{Distance}_{LY} \quad (27)$$

$$\text{Distance_NGC300}_{\text{Metres}} = 6.85E+6LY * 9.46073E+15\text{m/LY}$$

$$\text{Distance_NGC300}_{\text{Metres}} = 6.47997E22\text{m}$$

According to the principle of the Hubble constant, we will presume the current velocity of NGC 300 current velocity is above what it was 10 Billion years ago – so presume its average velocity ($\text{NGC300}_{\text{Average_Approach_Velocity}}$) since then was only ½ that: $7.25E4\text{m/s}$. Its distance then would be its current distance less its movement outward [$\text{Distance_NGC300}_{10\text{Billion_Years_Ago}}$] since then:

$$\begin{aligned} \text{Distance_NGC300}_{10\text{Billion_Years_Ago}} &= \text{Distance_NGC300}_{\text{Metres}} - \\ & (1.0E10\text{Years} * \text{Year}_{\text{Seconds}} * \text{NGC300}_{\text{Average_Approach_Velocity}}) \end{aligned} \quad (28)$$

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago}} = 6.47997E22\text{m} -$$

$$(1.0E10\text{yr} * 3.15576E7\text{s/yr} * 7.25000E4\text{m/s})$$

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago}} = 6.479967E22\text{m} - 2.28793E22\text{m}$$

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago}} = 4.19204E22\text{m}$$

^v William P. Blair & Knox S. Long; “Identification of Supernova Remnants in the Sculptor Group Galaxies NGC 300 and NGC 7793” The Astrophysical Supplement Series;
<http://iopscience.iop.org/0067-0049/108/1/261/fulltext/>

That distance in Light Years:

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago_LY}} = \text{Distance_NGC300}_{10\text{Billion_Years_Ago}} / \text{LY} \quad (29)$$

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago_LY}} = 4.19204\text{E}22\text{m} / 9.46073\text{E}+15\text{m/LY}$$

$$\text{Distance_NGC300}_{10\text{Billion_Years_Ago_LY}} = 4.43099\text{E}6\text{LY}$$

So approximately, by current theory, 10 billion years ago NGC300 was 4.43099E6LY away and M31 was 7.02014E6LY. In that time the two of them have moved millions of LY in opposite directions. Does this not demonstrate irretrievably that the Hubble Constant||Universe Expansion is a more complex issue than simple recession velocity as a ratio of distance. Is frequency decay through EM absorption by free, extremely disperse gaseous matter not a valid alternate to a theory that has absolutely conflicting data items in its hypothesis?

6.0 Summary

It has been taken as uncontestable by some in Science since the 1920's||1930's that the Hubble constant was evidence of the expansion of the initial detonation of all our reality, labeled the Big Bang. A very absolute majority currently accepts that un-contestability now, but that does not increase its validity in logic. The principle evidence given for the supposition is that the Red Shift that forms the base for that constant could only come about through increasing velocity as the body's separation from the Earth increases. There are strong arguments against this proposal. The principle ones would simply be that the expansion the Universe would then have proceeded for a hyper-Boson velocity for its entire lifetime, into a form that could never elicit the dimensions of the beginning Universe. A valid alternate explanation would be a Redshift brought about by the by absorption/re-emission by inter-galactic dark matter lessening the EM frequency at a rate of $7.32924E-27/m$. Additional arguments are reasoned for this evidence in following papers, with equations derived directly from the Classic Relativity Equations. The fundamental point in this entire paper can be expressed very simply: which is the most reasonable supposition? The Universe is not a perfect vacuum – established in many studies. The interference of an extreme disperse gaseous matter diffracts and redshifts all EM radiation entering into it though at a very slow rate because of the diffuseness of the gas, making it appear the farther an object it, the greater the rate of recession? Or that a Universe level mass of matter/energy 13.8 Billion years ago spontaneously exploded, expanded at an average 20 times the speed of light but, even under dispersion at that pace was spontaneously able to form stellar/cluster/Galactic matter objects?

This alternate supposition gains additional argument from the fact that by current Hubble theory, the M31 Galaxy and the NGC 300 Galaxy are at distances inconsistent with their recession velocity.

6.1 Reference Appendix

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6.2 Equation Appendix

1. $UDFj-39546284_{Distance_m} = UDFj-39546284_{Distance_LY} * Distance_{LY}$
2. $Universe_{Volume} = 4/3 * \pi * (UDFj-39546284_{Distance_m})^3$
3. $Energy || Matter_{Density} = Universe_{Mass} / Universe_{Volume}$
4. $Signal_{Return} = UDFj-39546284_{Distance_m} / c$
5. $UDFj-39546284_{Time_Outward_Years} = Universe_{Age} - Signal_{Return}$
6. $UDFj-39546284_{Time_Outward_Seconds} = Year_{Seconds} * UDFj-39546284_{Time_Outward_Years}$
7. $UDFj-39546284_{Velocity_Outward} = UDFj-39546284_{Distance_m} / UDFj-39546284_{Time_Outward_Seconds}$
8. $c_multiple_{Outward} = UDFj-39546284_{Velocity_Outward} / c$
9. $Volume_{Cosmic_Egg} = 4/3 * \pi * (Planck_{Length} / 2)^3$
10. $Density_{Cosmic_Egg} = Mass_{Universe} / Volume_{Cosmic_Egg}$
11. $M31_Recession_{Velocity} = M31_Distance_{Parsec} * Hubble_{Constant_km/s}$
12. $Distance_{Parsec} = 3.0856776E16m / Parsec$
13. $Distance_{UDFj-39546284_Mega_Parsecs} = 4.04597E9Parsec / 1000$
14. $Withdrawl_Velocity_{UDFj-39546284} = Distance_{UDFj-39546284_Mega_Parsecs} / H$
15. $Withdrawl_Velocity_{UDFj-39546284_m/s} = (2.74317E8km/s) * (1000m/km)$
16. $Velocity_{noSRPD} = Velocity_{SRPD} / (1 + Velocity_{SRPD}^2 / c^2)^{1/2}$
17. $Withdrawl_Velocity_{UDFj-39546284_c_multiple} = Withdrawl_Velocity_{UDFj-39546284_m/s} / c$
18. $Mass_{MW} = Mass_{Sun} * MW_{Solar_Masses}$
19. $Distance_M31_{Metres} = Distance_{LY} * Distance_{LY}$
20. $Escape_{MW} = (2 * G * Mass_{MW} / Distance_M31_{Metres})^{0.5}$
21. $Proportion_{Escape_Velocity} = Escape_{MW} / M31_{Velocity}$
22. $Volume_{MW || M31_Sphere} = 4/3 * 3.14159 * (Distance_M31_{Metres})^3$
23. $Density_{MW || M31_Sphere} = Universe_{Mass} / Volume_{MW || M31_Sphere}$
24. $Gravity_{MW || M31_Sphere} = Graviational_{Constant} * Mass_{Universe} / (Distance_M31_{Metres})^2$
25. $M31_{Average_Approach_Velocity} = M31_{Velocity} / 2$
26. $Distance_M31_{10_Billion_Years_Ago} = Distance_M31_{Metres} + (1.0E7Years * Year_{Seconds} * \sim M31_{Average_Approach_Velocity})$

6.2 Equation Appendix (cont'd)

$$27. \text{Distance_M31}_{10_Billion_Years_Ago_LY} = \text{Distance_M31}_{10_Billion_Years_Ago} / \text{Distance}_{LY}$$

$$28. \text{Distance_NGC300}_{Metres} = \text{Distance_NGC300}_{Metres} * \text{Distance}_{LY}$$

$$29. \text{Distance_NGC300}_{10_Billion_Years_Ago} = \text{Distance_NGC300}_{Metres} - \\ - (1.0E10\text{Years} * \text{Year}_{Seconds} * \text{NGC300}_{Average_Approach_Velocity})$$

$$30. \text{Distance_NGC300}_{10_Billion_Years_Ago_LY} = \text{Distance_NGC300}_{10_Billion_Years_Ago} / LY$$