

Simple Explanation for the ‘Cosmological red-shift’ And It’s Evidence

By

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Abstract

Photon is a chunk of energy $h f$, where h Planck’s constant, and f is frequency. Every chunk of energy or mass must produce a gravitational field around it. Now, when this chunk of energy moves from one to another position, in the manner of ‘quantum jumps’, the gravitational-field around the previous position has to collapse, and new field should keep getting established around the new positions. These productions and collapses of gravitational field should give rise to gravitational waves or ripples. These ripples must carry certain amount of energy with them, and this energy can come only from the kinetic energy of the photon. So the energy of the photon should keep on reducing, which we have been observing as the ‘cosmological red-shift’. And we can express this reduction in kinetic-energy of the photon as deceleration of the photon. If such a deceleration is true for a chunk of energy called photon, then it must be true for every particle of matter too. Strikingly, the decelerations experienced by the space-probes Pioneer-10, Pioneer-11, Galileo and Ulysses, as carefully measured by Anderson J.D. et. Al., match perfectly with the deceleration of the ‘cosmologically red-shifting photons’; thus providing supportive evidence for this simple explanation.

Introduction:

Since the date Edwin Hubble published his paper on the ‘cosmological red-shift’, at least sixty different explanations have been proposed by different scientists. Out of them the ‘expansion of space’ is currently most popular. This writer has been of the opinion that ‘time’ is not a physical entity; so Einstein’s ‘space-time-continuum’ is a mathematical model. ‘Space-time-continuum’ is not a physical entity, so ‘expansion of space’ may also be a ‘mathematical term’ not a physical reality. It was also noticed by this writer that the ratio $z_c / z_e = (G m_e m_p) / e^2$, that is: the ratio of (loss in energy of cosmologically red-shifting photon at any distance D) and (the loss in electrostatic potential-energy of the electron at that distance D) strikingly remains equal to the famous ratio $(G m_e m_p) / e^2$. So I have been trying to think in terms of possible ‘gravitational effects’ on the inter-galactic photons, e.g. Ref.3. So in the previous two papers, posted at the pre-print server site viXra, I considered a possibility of ‘virtual particles’ in the space absorbing the photons and re-emitting two kinds of waves, namely electromagnetic and gravitational; branching out the absorbed energy into two parts. Another possibility considered in the past was that the photon may have to climb the ‘gravitational-well’ produced by the photon’s own quantum of energy. Now, in this paper it is discussed that the repeated productions and collapses of the ‘gravitational field’ produced by the photon should give rise to ‘gravitational waves’ or ‘ripples’ which should carry certain amount of energy with them. So the photon has to continuously keep on losing energy, which we have been interpreting as ‘the cosmological red-shift’. Then it is argued that if it is true for a chunk of energy called ‘photon’, then it must be true for every chunk of energy and ‘matter’. Strikingly, the decelerations measured for Pioneer-10, 11, Galileo and Ulysses space-probes match perfectly with the value of deceleration of the photons. This writer is aware of various explanations for Pioneer anomaly

proposed; like the thermal radiations, but they can not be the same for all the space-probes. Matching of decelerations of four space-probes itself is a striking phenomenon; and its matching with the deceleration of the photon can not be ignored by a scientific mind as a coincidence. So in the humble opinion of this writer these observations should be considered as evidence for the simple explanation for the ‘cosmological red-shift’ proposed here. After a lengthy survey of several years of debate by the authors of the original 1998 paper documenting the Pioneer-anomaly, the authors conclude, "Until more is known, we must admit that the most likely cause of this effect is an unknown systematic. (We ourselves are divided as to whether 'gas leaks' or 'heat' is this 'most likely cause.')" The write of this paper humbly feels that the correct explanation for the pioneer anomaly is found only now in this paper.

Derivations:

Linear part of the ‘cosmological red-shift’ is expressed as:

$(h f_0 - h f) / h f = H_0 D / c$ where H_0 Hubble’s constant, and c is the speed of light.

i.e. $(h f_0 - h f) = (h f / c^2) (H_0 c) D$

That is, the reduction in kinetic-energy of the photon is equal to its mass $(h f / c^2)$ times the deceleration $(H_0 c)$ times the distance D traveled by it.

Numerically, the quantity $(H_0 c) = 6.67 \times 10^{-10}$ meter/second², and the decelerations experienced by all the space-probes were also of the same order of magnitude 10^{-10} meter/second², thus providing supportive evidence for our simple explanation!

Another interesting observation (Ref-4) is, that the accelerations $G M / R^2$ at the surface of the electron, the proton, the nucleus-of-atom, the globular-clusters, the spiral galaxies, the galactic-clusters and the whole universe too are of the same order of magnitude as $H_0 c$!

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Yours faithfully,



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