

Cosmology by Cosmic Dust

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In 1929, Edwin Hubble formulated a law that the velocity of a receding galaxy is proportional to its distance to the earth. This meant that a galaxy moving away from us twice as fast as another galaxy is twice as far away. Hubble based his law on Doppler's effect whereby the wavelength of light from the galaxy is redshift if the galaxy is moving away from us. Thus, by measuring the redshift of known spectral lines, Hubble claimed to estimate the recession velocity of the galaxy relative to the Earth.

Today, astronomers [1,2] take Hubble's Law as proof the Universe is expanding based on the redshift of supernova light. If, however, there the redshifts could be shown to have a non-Doppler origin, the Universe need not be expanding. Redshift without an expanding Universe is of utmost importance because many of the outstanding problems in cosmology would be resolved.

In this paper, the redshift of light from galaxies and supernovae is shown to occur [3] upon absorption in cosmic dust particles (DPs) by the mechanism of QED induced EM radiation. QED stands for quantum electrodynamics and EM for electromagnetic. Only a single photon is necessary. QED induced redshift may be understood by treating the absorbed photon as EM energy confined within the DP. Recalling from quantum mechanics that photons of wavelength λ are created by supplying EM energy to a box with walls separated by $\lambda/2$, the EM energy of the absorbed photon creates a redshift photon depending on the DP geometry. Correcting for the reduced speed of light in the solid DP by the refractive index n_r , the photon created is observed at wavelength λ_o ,

$$\lambda_o = 2Dn_r = 4an_r \quad (1)$$

where, D is the DP diameter, and $a = D/2$ is the DP radius. The redshift Z is,

$$Z = \frac{\lambda_o - \lambda}{\lambda} \quad (2)$$

where, λ is the wavelength of the distant light. From [4], the DP radius varies from $a = 0.005$ to 0.25 microns, Fig. 1 shows the redshift Z of Ly α lines for amorphous silicate having $n_r = 1.45$. At the upper bound DP radius of 0.25 microns, the Ly α lines are redshift to Z of about 10.

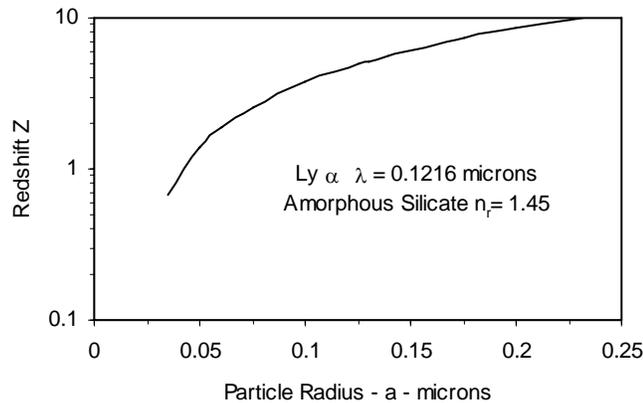


Fig. 1 Cosmic dust induced redshift of Ly α Line

The QED induced redshift is caused solely by the absorption of the galaxy photon in DPs and has nothing to do with an expanding Universe. Given that supernova light is unequivocally absorbed by DPs on its way to the Earth, the Hubble redshift Z is highly likely not related to an expanding Universe, but rather to absorption in DPs. It therefore follows that any implied relation [1] of dark energy to an

expanding Universe is unphysical. What this means is the Universe may still be expanding and dark energy may still exist, but cannot be proven from redshift measurements of Supernovae light.

But QED induced redshift has further consequences. Indeed, DPs hold in question the Hubble redshift as proof the Universe began in the Big Bang suggesting the notion once proposed by Einstein of a static Universe in dynamic equilibrium is a far more credible cosmology. Other consequences of redshift in cosmic dust are:

Dark Energy not needed to explain a Universe that is not expanding
Period-luminosity relation qualified in Cepheid stars
Dark Matter not needed in Gravitational Lensing
Galaxy Rotation Problem resolved without Dark Matter
No need for MOND to explain Galaxy Rotation Problem
Tolman Surface Brightness reduction by $(1 + Z)$
Explain the Independence of Redshift in Sunyaev-Zeldovich Effect
Light Curve dilation in Supernovae Explosions

References

- [1] Riess, A.G., et al., "Type Ia Supernova Discoveries at $Z > 1$ from the Hubble Space Telescope Evidence for Past Deceleration and constraints on Dark Energy Evolution," ApJ, 607, 665, 2004.
- [2] Corasaniti, P.S., "The Impact of Cosmic Dust on Supernova Cosmology," MNRS, February 2008.
- [3] Prevenslik, T.V., "Einstein's Universe and Cosmic Dust," at www.nanoqed.org, 2009
- [4] Weingartner, J.C. and Draine, B.T., "Dust Grain Size Distributions and Extinction in the Milky Way, large Magellanic Cloud, and Small Magellanic Cloud," AsJ, 548, 296. 2001.