

Cosmological redshift model now experimentally confirmed

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Abstract: A theoretical model [D. L. Mamas, Phys. Essays **23**, 326 (2010)], which accounts for the cosmological redshift in a static universe, now has experimental confirmation. In this model, the photon is viewed as an electromagnetic wave whose electric field component causes oscillations in deep space free electrons which then reradiate energy from the photon, causing a redshift. Calculations from the model match well the anomalous redshift of Wernher von Braun's Pioneer 6 spacecraft. © 2015 Physics Essays Publication.
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Résumé: Un modèle théorique [D. L. Mamas, Phys. Essays **23**, 326 (2010)], qui explique le décalage vers le rouge cosmologique dans un univers statique, est maintenant confirmé expérimentalement. Selon ce modèle le photon est visualisé comme une onde électromagnétique, dont la composante électrique cause des oscillations dans les électrons libres dans l'espace intergalactique qui ensuite diffusent l'énergie du photon, causant un décalage vers le rouge. Les calculs de ce modèle s'accordent bien avec le décalage vers le rouge anormal de la sonde Pioneer 6 de Wernher von Braun.

Key words: Cosmology; Cosmological Redshift; Cosmological Models; Pioneer 6; Static Universe; Anomalous Redshift; Cosmic Rays.

I. INTRODUCTION

An explanation for the cosmological redshift with no expansion of space needs to be simple and must satisfy all required conditions such as avoiding the problem of blurring of images. Such a model has been presented,¹ and this wave-particle model now has found experimental confirmation.

In this wave-particle model, the photon is viewed as an electromagnetic wave which passes over free electrons, one at a time, in deep space. Maxwell's equations demand that a free electron oscillates and reradiates energy, necessarily at the expense of the photon which can then be expected to redshift. As previously reported in detail, the wave-particle model accounts satisfactorily for the cosmological redshift.¹ In accordance, Accardi *et al.* have demonstrated that it is permissible within the theory of quantum electrodynamics that a photon, viewed as a wave in a Fermi sea of free electrons, lose energy to the electron sea and redshift.² Finally, it should be noted that the simple wave-particle model by itself is fully able to account for the cosmological redshift of the Hubble diagram without any need for the grossly more complicated hypothesis of expanding space.

II. EXPERIMENTAL CONFIRMATION

Experimental confirmation of the wave-particle model for the cosmological redshift has now been obtained from redshift data received from Wernher von Braun's Pioneer 6 spacecraft. Accardi's Fig. 1, which is reproduced here, exhibits the redshift data received from Pioneer 6 as the

spacecraft passed behind the Sun, the spectrally pure carrier wave (2292 MHz) signal from the spacecraft passing through the sea of free electrons in the Sun's surrounding plasma. Distance d is the distance of the Pioneer 6 radio signal from the Sun in units of solar radii. In the graph, Accardi plots a prediction of redshift as permitted by quantum electrodynamic theory. The wave-particle prediction for redshift, which is based on a specific and well defined mechanism, is here superimposed (in bold) on Accardi's Fig. 1. Redshifts are calculated using the known electron densities in the plasma surrounding the Sun,³ and Eq. (5) (Ref. 1) which states that for small redshifts $z = Cn_x$, or $z = \int Cn(x)dx$, where z is redshift, C is the Thomson scattering cross section for electrons, $n(x)$ is the electron density of the plasma at each point, and x is the distance traveled through the plasma by the signal from the Pioneer 6 spacecraft. The graph shows that the wave-particle model conforms reasonably to the experimental data.

III. CONCLUSIONS

The wave-particle explanation for the cosmological redshift with no expansion of space has now received experimental support. The unwieldy hypothesis of expanding space as an explanation for the cosmological redshift is now superfluous and unnecessary. Freed from the constraints imposed by expanding universe models, it finally becomes possible to understand phenomena such as quasars and gamma ray bursts, as well as cosmic rays, as being attributable to matter-antimatter annihilation in a universe composed of equal amounts of matter and antimatter.⁴ In order to progress into the new century, modern astronomy needs to be

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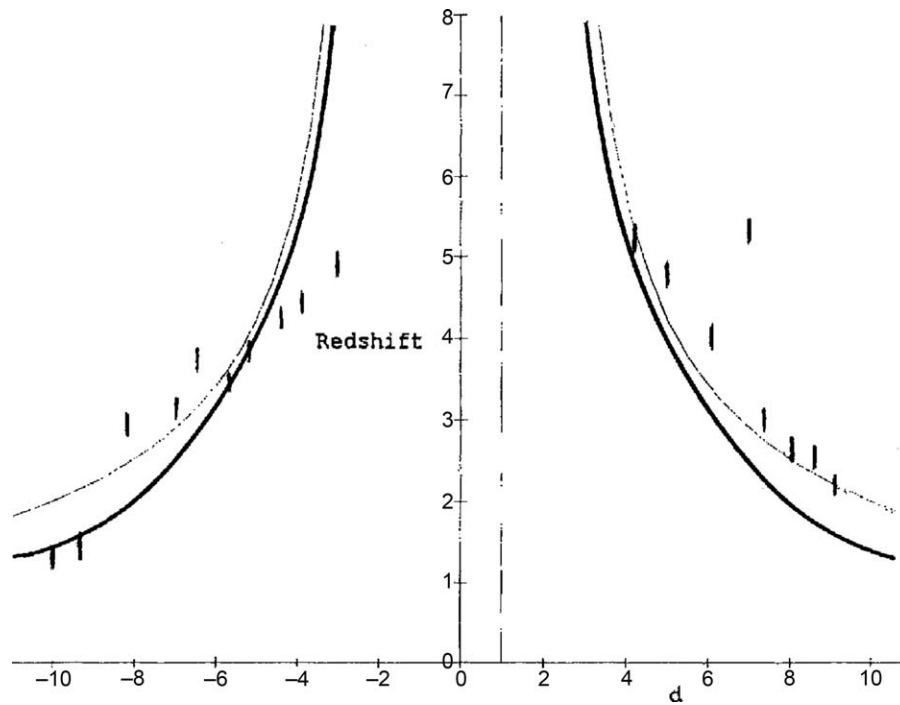


FIG. 1. Accardi's graph of redshift (in units of 10^{-8}) plotted against the distance d of the Pioneer 6 spacecraft radio signal from the Sun (in units of solar radii). Accardi's quantum electrodynamics curve fits well the data points, as also does the calculation from the wave-particle model which is the superimposed bold curve.

completely and finally freed of the unnecessary constraints imposed by expanding space models which may now be discarded.

¹D. L. Mamas, *Phys. Essays* **23**, 326 (2010).

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