Unveiling New Perspectives: A Continuous Electromagnetic Field and the Eternal Universe

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Abstract:

This article aims to elucidate the latest observations from James Webb that deviate from the current understanding of the universe. To grasp the provided explanation, one may need to reconsider the assumed quantization of the electromagnetic field.

1. Introduction

The generation of signals for frequency modulated continuous wave (FMCW) measurements remains unclear, particularly in explaining measurement principles for very small signals [1, 2]. A recent study has revealed that a quantized model of the electromagnetic field falls short in explaining measurement outcomes, emphasizing the necessity of acknowledging a continuous field [3]. The first section of this paper provides a straightforward explanation of the foundational aspects of FMCW and elucidates why it signifies the continuity of the field.

Upon establishing clarity in this regard, the discourse extends to the implications of this newfound understanding. Notably, one implication is the potential discrediting of the assumption that the universe is expanding. The recognition of a continuous electromagnetic field opens the door to a reconsideration and potential revalidation of the 'tired light' theory, originally proposed by Zwicky [4].

2. The Continuity of the Electromagnetic Field

Proving the continuity of the electromagnetic field is straight-forward. The experimental setup is illustrated in Figure 1.

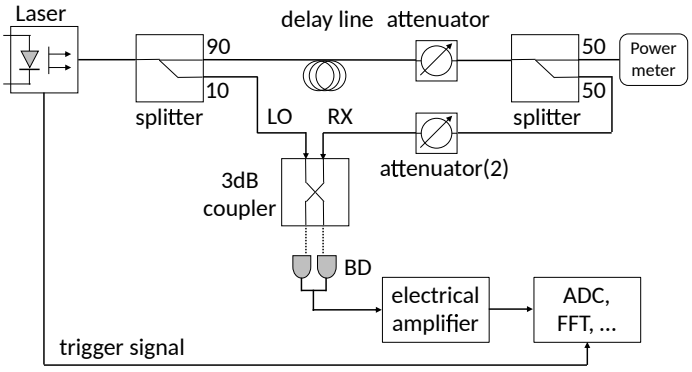

Fig. 1. Self-Heterodyne Measurement Setup for Proving the Continuity of the Electromagnetic Field

In Frequency Modulated Continuous Wave (FMCW), a laser dynamically varies its frequency over time, serving as a local oscillator to amplify a signal that is both attenuated and delayed,

originating from the same laser source. In LiDAR measurements, the signal is produced by reflecting the laser off a target. In the depicted setup, this process is optimized by employing only an attenuator and a delay line, strategically eliminating speckle that would typically arise from reflection in free space.

FMCW enables the direct measurement of incoming photons by establishing a connection between the received signal and the shot noise generated by the local oscillator. In essence, the count of perceived photoelectrons is directly derived from the normalized power spectrum, representing the product of the number of incoming photons, the quantum efficiency of the detector, its excess noise, and a factor associated with the overlap of the local oscillator and the signal at the detector. To validate and assess the sensitivity of the FMCW measurement, one can cross-reference the output power of a laser source (alongside previously measured attenuators) with the observed value of the measurement system. Once this validation is achieved, the laser power should be gradually reduced to levels where the perceived energy falls within the range of a few photons.

The detected signal originates from a beat note, a consequence of the frequency disparity between light from the local oscillator and light from the delayed signal when they interfere at the balanced detector in the measurement system. The detector, a photodetector, is sampled at a high frequency, specifically 500 MHz in the current setup. The measurement interval for a single shot consists of 16384 samples, corresponding to a measurement time of $32.768\mu s$.

If the electromagnetic field were quantized, interference between the signal path and the local oscillator path would be expected to occur only during the measurement times when a photon from the signal path arrives within the interval of 16384 single measurements. However, contrary to this expectation, interference is consistently observed during each individual measurement within the interval. The energy in the time signal of the beat note, which constitutes the energy observed in the Fast Fourier Transform (FFT), is distributed across all 16384 measurements. Consequently, when measuring, for example, 10 'photons', the energy associated with these 'photons' is spread across a much larger number of measurement intervals, indicating their reception in fractions. This challenges the concept of indivisible photons, suggesting that only a continuous electromagnetic field can adequately explain the observed measurement results. For a more detailed exploration, refer to [3].

3. A Not Expanding, Eternal Universe

Findings from the James Webb telescope's recent measurements have unveiled discrepancies that challenge our current comprehension of the universe. Distant galaxies, as observed, exhibit sizes that defy justification within the framework of existing models of the cosmos. Moreover, the elemental composition within these galaxies appears inconsistent with what contemporary physics would predict based on their hypothesized age [5, 6]. These revelations prompt a critical question: What are the implications of these observations, and how might we elucidate and reconcile these unexpected findings within the current scientific understanding?

A pivotal consideration in this context pertains to a foundational principle of quantum physics – the quantization of the field. Originally introduced by Einstein in conjunction with the photoelectric effect, this concept has remained largely unquestioned since its inception. However, it is this presumedly false assumption that has unwittingly steered the interpretation of reality astray in various domains. The imperative for a continuous electromagnetic field has found support through frequency modulated continuous wave (FMCW) measurements, demonstrating the limitations of the quantization hypothesis. Recent experiments involving pulsed light align with the notion of a continuous field, as suggested by the author, offering explanations that resonate with this paradigm shift [7].

Physics has long grappled with the recognition that gravity at considerable distances exhibits discrepancies with established equations. Similarly, abandoning the notion of quantized light

opens up the intriguing possibility that light may indeed lose energy during its propagation over extended distances. In a non-quantized framework, this energy loss need not exclusively result from interactions with matter; it could also involve interactions with the fabric of space itself. The observed redshift in measurements may find its roots in two distinct causes: first, a redshift originating from the distance traversed by light, presumably within the context of spacetime; and second (together with blueshift), the relative velocity between the emitter and the measurement device. This alternative perspective eliminates the necessity for positing an expanding universe. Furthermore, the ubiquitous microwave radiation recognized as cosmic background radiation might be reinterpreted as redshifted light from exceedingly distant objects, challenging the conventional notion of it being a remnant of the Big Bang.

4. Conclusion

The quantization of the electromagnetic field, a fundamental tenet of quantum physics, is strongly called into question, casting doubt on a cornerstone principle. The potential falsity of this concept has far-reaching consequences, potentially destabilizing numerous theories built upon its assumptions. This revelation could trigger a paradigm shift, with the "retired light" theory emerging as a viable alternative. Embracing this alternative may, in turn, lead to the consideration of a non-expanding, eternal universe. The interconnectedness of these propositions opens the door to a profound reevaluation of our understanding of the fundamental aspects of the cosmos.

5. Disclosure

The author declares no conflicts of interest.

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