New Light on the nature of 'Light'

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Abstract

My study of wave-particle-duality of light, as described in a paper: "Proposed explanations for the wave-particle duality of light and double-slit interference experiments" (Tank, H. K. http://vixra.org/pdf/1407.0036v2.pdf) leads to new light about the true nature of 'light'; that real wavelengths and frequencies of 'light' are not what we have been thinking so far; rather, they are the 'distances' and 'time-rates' of repetitions 'particles' in space and time. The actual frequencies and wavelengths of the 'wave' are likely to be much higher, possibly close to the frequency of the electron, of the order of 10^{22} cycles/second. It was found in the above-cited paper that if light is both 'wave' as well as 'particle', then a photon should contain a wide 'band' of waves, rather than a single frequency; and whenever and wherever all the spectral components of the wide band get constructively added a 'particle' gets formed. The wavelength and frequency of the actual wave, and the 'distances' and 'time-rate' of consecutive formations of 'particle' are two different phenomena. So far we have been taking the 'distances' and 'time-rates' of formation of 'particles' as the wavelength and frequencies of light, which may not correct, in the light of this new finding.

Detailed description:

My study of wave-particle-duality of light, as described in a paper: "Proposed explanations for the wave-particle duality of light and double-slit interference experiments" (Tank, H. K. http://vixra.org/pdf/1407.0036v2.pdf) showed that in the experiments on 'light' performed so far there has been quite a wide band of waves involved, because at the frequencies of light generation and filtering of purely monochromatic wave of one Hertz bandwidth is technically not possible so far. So the spectral components of this wide band constructively add only at discrete points in space and time, and mutually nullify their amplitude at rest of the points. And they have been these constructive superimpositions of all the spectral-components of the wide band, which we have been detecting as the 'particles'. Pl. see the graphs of fig.1 below:

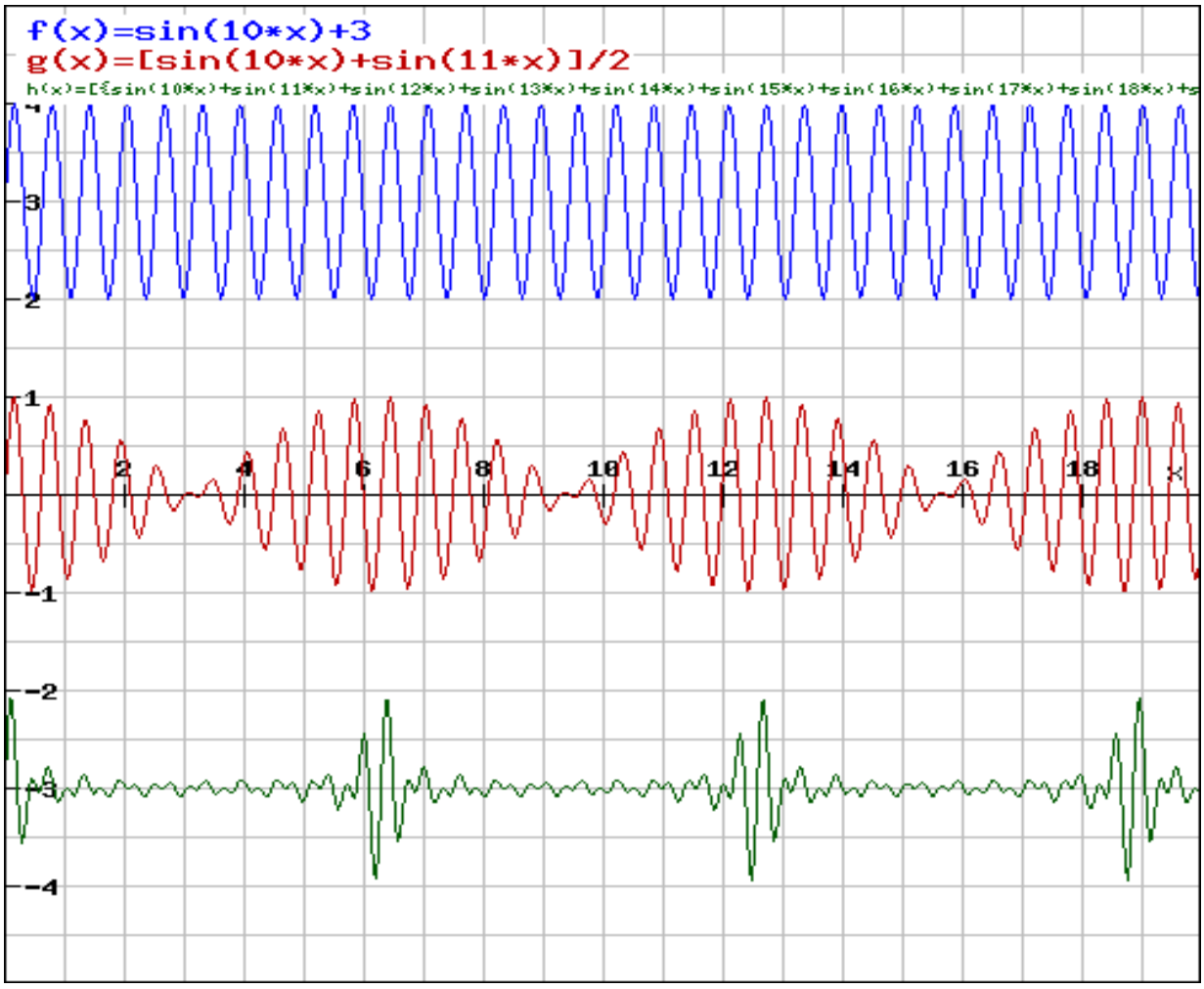

Fig.1: (i) Blue curve, on the top, shows a wave of purely single frequency, Sin (10* x); (ii) the red curve, in the middle, shows that when two waves get added, their amplitude start varying in space and time; and (iii) the green curve, at the bottom, shows that when so many waves of slightly different frequencies get added, e.g: sin(10*x)+Sin(11*x)+sin(12*x)+sin(13*x)+ sin(14*x)+sin(15*x)+sin(16*x)+sin(17*x)+sin(18*x), then they coherently add only at discrete places in space and time; and mutually nullify their amplitudes at other points in space and time. Such packets of waves, formed due to superimpositions of a wide band of waves, are detected by the detector as the 'particles'.

Now in this paper it is shown that: wavelengths and frequencies of the actual spectral-components and the 'distances' and 'time-rate' of formation of 'particle' are two different phenomena; as can be seen from the fig.2 below:

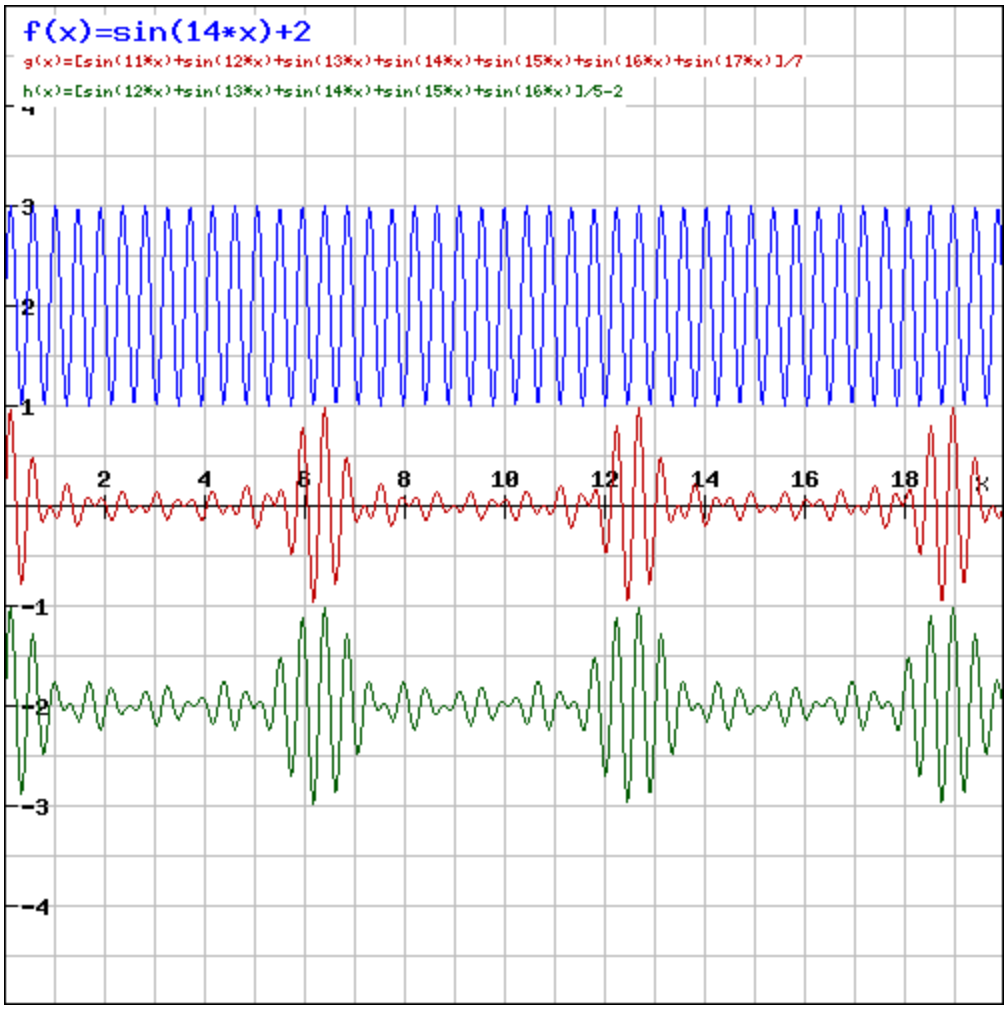

Fig.2: (i) The blue-colored graph at the top shows central spectral-component of the actual band of waves, sin(14*x). (ii) The red-colored graph in the middle shows superimposition of a wide band of waves: sin(11*x)+sin(12*x)+ sin(13*x)+sin(14*x)+ sin(15*x)+sin(16*x)+ sin(17*x)/7, and we find that constructive superimposition of all the spectral components takes place at much slower rate than the frequencies of the actual waves. (iii) The green-colored graph at the bottom shows that when a different band of the actual waves is taken, e.g. sin(12*x)+sin(13*x)+ sin(14*x)+sin(15*x)+ sin(16*x)+sin(17*x)+ sin(18*x)/7, then the 'distances' of constructive superimpositions of all the spectral-components get changed.

The new light on the nature of 'light' emerging from the above discussion is that so far we have been thinking the 'distances' and 'time-rates' of emergence of 'particles' as the wavelength and frequency of light. From the fig.2 we find that the 'distances' and 'time-rates' of 'particles' are

much lower than the wavelengths and frequencies of the actual band of waves. In the experiments on ‘light’ performed so far, e. g. the double-slit interference experiments, we have been actually measuring the distances between highest detection-rates of the ‘particles’, which are different from the wavelengths of the actual waves contained in the wide band. This discussion leads us to a new possibility, that wavelengths and frequencies of the actual band of waves, forming the ‘particles’ of ‘light’, may be much higher than what we have been thinking so far. Since ‘light’ is emitted by the electrons, the frequencies of the actual waves may close to the frequency of the electron, of the order of 10^{22} cycles/second.

References:

[1] Tank, H. K. ““Proposed explanations for the wave-particle duality of light and double-slit interference experiments” http://vixra.org/pdf/1407.0036v2.pdf