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 thewave-particle duality of light and double-slit interference of single photons" (Tank, H. K. http://vixra.org/pdf/1407.0036v2.pdf) leads to new light about the true nature of 'light'; that: (i) either the real wavelengths and frequencies of the 'waves' of 'light' are not what we have been thinking so far; or (ii) the rate of formation of 'particles' called 'photons' is at much slower rate than the frequency of the waves. 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 wavelengths and frequencies of the actual band of waves, and the 'distances' and 'time-rate' of successive formations of 'particle' are two different phenomena. Therefore, (i) if the wavelength of the wave measured by us is 'distance' between two successive formations of 'particles' then the frequency of the actual wave may be much higher; or (ii) if the wavelength measured by us is wavelength of the actual wave, then the formation of 'particles' called 'photons' may be at much slower rate than the frequency of the wave.. If we can establish perfect relation between wavelengths of the band of waves, and 'distance' between successive formations of 'particles', then it may be possible to make deterministic prediction of detection of 'photons'.

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 of single photons" (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 amplitudes 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:

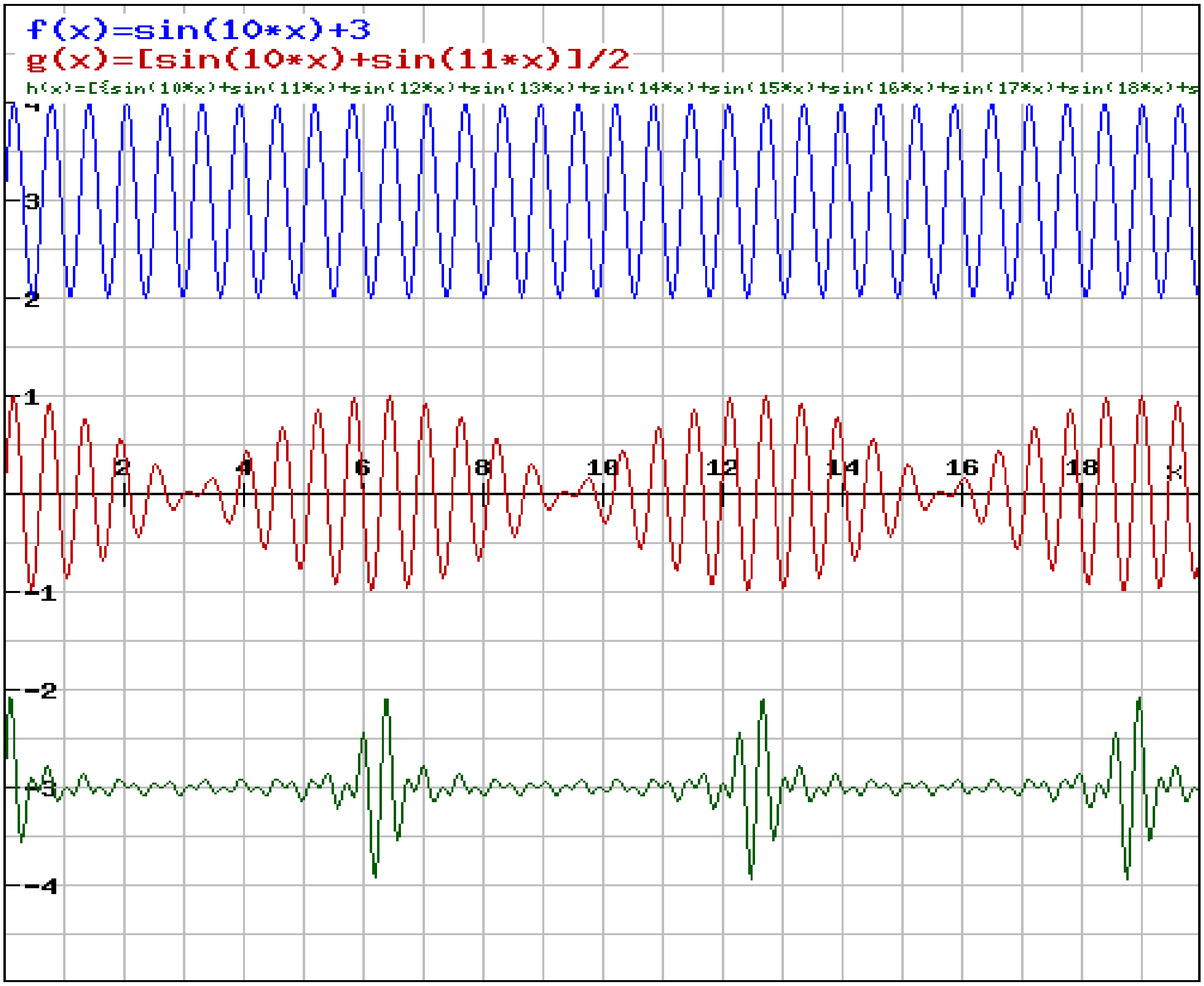

Fig.1: (i) Blue curve, on the top, shows a wave of purely single frequency, Sin (10* x); (ii) the red curve, in the middle, shows that when two waves get added, their amplitude start varying in space and time; and (iii) the green curve, at the bottom, shows that when so many waves of slightly different 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 of the wave and 'distances' and 'time-rate' of formation of 'particle' are two different phenomena; as can be seen from the fig.2 below:

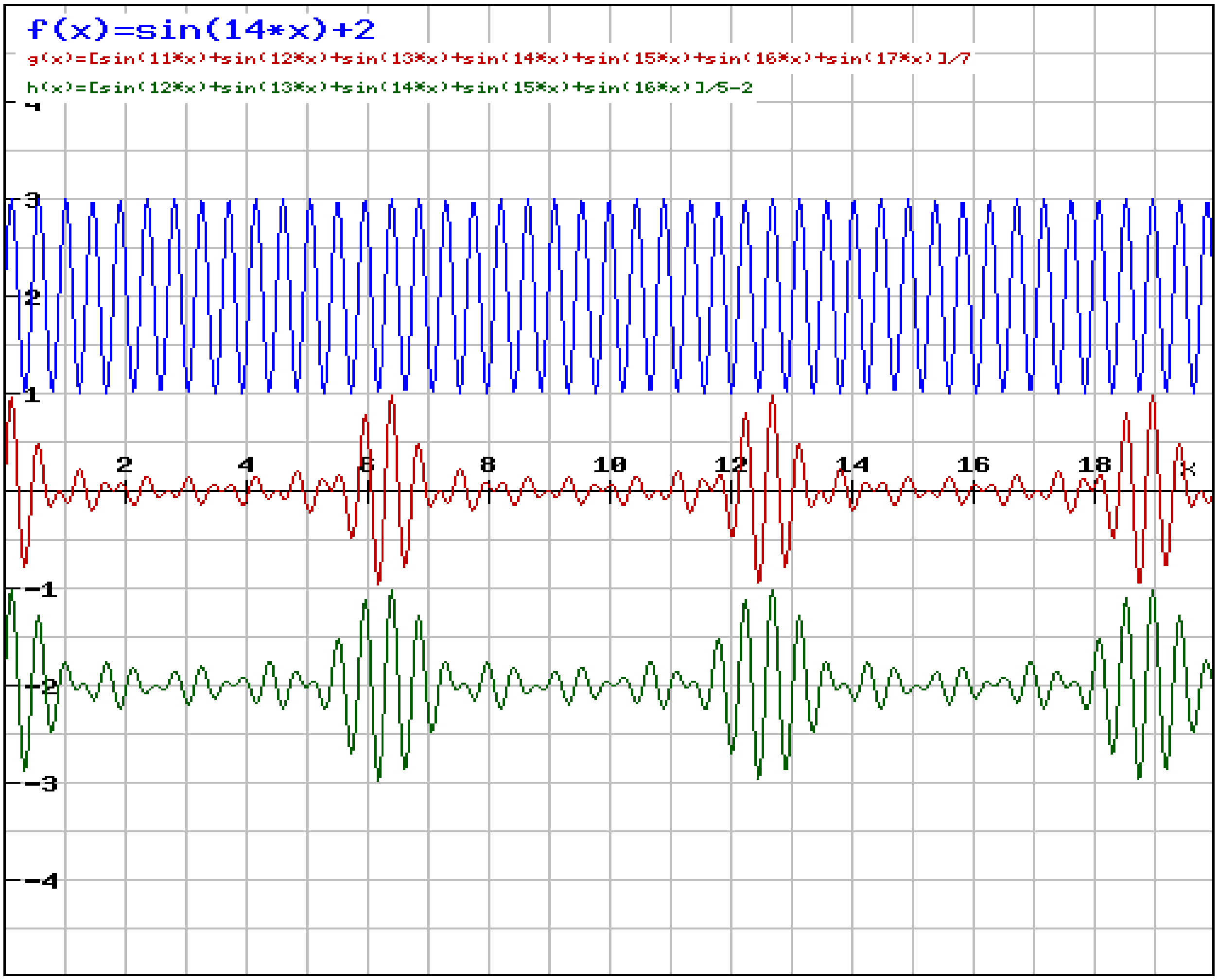

Fig.2: (i) The blue-colored graph at the top shows central spectral-component of the actual band of waves, sin(14*x). (ii) The red-colored graph in the middle shows superimposition of a wide band of waves: sin(11*x)+sin(12*x)+sin(13*x)+sin(14*x)+sin(15*x)+sin(16*x)+sin(17*x)/7, and we find that constructive 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 insight into the nature of 'light' emerging from the above discussion is that: The wavelengths and frequencies of the actual band of waves, and the 'distances' and 'time-rate' of successive formations of 'particle' are two different phenomena. The rate of formation of 'particles' is much slower, than the frequency of the actual wave wave. Therefore: (i) if the wavelength of the wave measured by us is 'distance' between two successive formations of 'particles' then the frequency of the actual wave may be much higher; or (ii) if the wavelength measured by us is wavelength of the actual wave, then the formation of 'particles' called 'photons' may be at much slower rate than the frequency of the wave. Out of these two possibilities, second possibility seems to be more likely. If we can establish perfect relation between wavelengths of the band of waves, and 'distance' between successive formations of 'particles' then it may be possible to make deterministic prediction of detection of 'photons'.

References:

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