Proving the Virtuality of the Frequency of Electromagnetic Waves Using a Table with Different Light Spectra but With the Same Frequency

Gh. Saleh

Saleh Research Centre, Netherlands

Considering the decomposed light from sunlight, there are 7 primary colors, each with a specific frequency and wavelength. However, when pure light sources are combined as ordered pairs—for example, if we combine pure red light with a frequency of 450 THz and pure violet light with a frequency of 750 THz in equal proportions—and wish to define a frequency for this combined light, we might calculate the average of the two frequencies, yielding 600 THz. Notably, the combination of red and violet produces a distinctive magenta color. Interestingly, while this frequency falls within the range of green light, the combined color does not resemble green in appearance. In other words, although the average frequency value of 600 THz corresponds to the green spectrum, the resultant magenta light is entirely distinct from green.

Therefore, it may be concluded that frequency acts as a secondary parameter in electromagnetic waves, whilst wavelength remains a primary parameter that does not change. We observe that various light combinations yield different colors despite having identical frequencies.

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postmaster@saleh-theory.com

Visible Spectrum Frequency Table

Range (THZ)	Color	Name	F (THz)	Status
370 - 450		Black	370	Pure
		Red	400	Pure
450 - 500		Firebrick	483	Averaged
		Gold	491	Averaged
		Orange	495	Pure
		Chocolate	496	Averaged
		Olive	500	Averaged
500 - 550		Brown	501	Averaged
		Yellow	515	Pure
		Peru	529	Averaged
		Chartreuse	534	Averaged
		Deep pink	549	Averaged
550 - 575		Khaki	567	Averaged
		Olive drab	570	Pure
		Hot pink	572	Averaged
		Tan	574	Averaged
		Peach puff	575	Averaged
575 - 600		Green	580	Pure
		Pink	584	Averaged
		Beige	593	Averaged
		Grey	600	Averaged
		White	600	Averaged
		Magenta	600	Averaged
		Silver	600	Averaged
600 - 625		Indigo	610	Pure
		Medium orchid	610	Averaged
		Slate gray	617	Averaged
		Powder blue	617	Averaged
		Navy	625	Averaged
625 - 650		Sea green	630	Averaged
		Dark slate gray	631	Averaged
		Cadet blue	631	Averaged
		Dark violet	635	Averaged
		Blue	650	Pure
650 - 700		Steel blue	658	Averaged
		Turquoise	658	Averaged
		Teal	700	Averaged
		Cyan	700	Averaged
		Purple	700	Pure
700 - 750		Violet	750	Pure

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Result:

The above table clearly demonstrates that several different light spectra possess identical frequencies. Given these diverse color combinations, one may deduce that their wavelengths remain constant, whilst frequency emerges as a secondary and dependent parameter. The existence of different lights with identical frequencies indicates variations in their wavelengths. Indeed, in the fundamental formula:

$$v = \frac{\Delta x}{\Delta t} \Rightarrow C = \frac{\lambda}{T} \Rightarrow \boldsymbol{C = \lambda F}$$

Variations in velocity or wavelength combinations can increase or decrease the frequency, making it a dependent variable. To put it more precisely in physical terms, the wavelength determines the propagation pattern of an electromagnetic wave and has a fixed form and structure, whereas frequency lacks inherent stability. Instead, frequency transforms as the wavelength changes or when the speed approaches relativistic values (close to C), causing light frequencies to shift up or down.

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