

THE UNCERTAINTIES OF LIGHT

Bertrand Wong, Eurotech, S'pore Branch, Email: bwong8@singnet.com.sg

Abstract

This paper touches on the subject of whether light really needs a medium, which is termed the luminiferous ether, for its transmission as is in the case of sound which requires a fluid such as air or liquid as the medium for its transmission, and the subject of the velocity of light.

Einstein in his relativity theory had done away with the luminiferous ether being the medium for the transmission of light. But a number of scientists today are apparently trying to resurrect the role of the luminiferous ether. Is the luminiferous ether indeed necessary for the transmission of light?

Light should not be expected to act the same as sound as they are both intrinsically different. Sound is the result of vibrations in the air (a medium of transmission for sound), vibrations which reach our ear-drums at varying frequencies, i.e., sound is actually moving, vibrating air which affects our ear-drums. Light has been described as a “wave/particle” object – it could be viewed as both a wave and a particle. Does it make sense to expect light too to travel through a medium like sound does? The quantum particle of light is the photon, which is rather similar to the other quantum particles such as the positron, electron, proton and neutron, etc., whereas sound has no quantum particle within it, being just vibrations or physical movements of the air (which affect the sensitive ear-drums). Quantum particles evidently do not need a medium for their functionality. Why should quantum light need a medium such as the luminiferous ether for its transmission?

The Michelson-Morley experiment and others did not find any evidence of this medium, the luminiferous ether. And, apparently from this “null” result of the Michelson-Morley experiment it had been concluded, evidently without much justification, that the velocity of light is invariable, and that nothing could travel faster than the velocity of light, which has apparently just recently been disproved by CERN. Moreover, quantum particles have been found to be capable of teleportation, i.e., transport to another location in space instantaneously, to display “weirdness” (i.e., appear strange and incomprehensible). From all this, it could be concluded that unlike sound, which requires a medium such as air or liquid for its transmission, for light such a medium is not a necessity.

On the other hand, if the luminiferous ether exists (as the medium for the transmission of light), doesn't it have to be composed of atoms, or, quantum particles, as well (the luminiferous ether here appears comparable, e.g., to the carrier signal which carries the picture and sound signals to our TV set all the way from the transmitter at the broadcasting station which could be many miles away)? For those who have been toying with the idea of the luminiferous ether or who are convinced that it exists, how would they describe this medium, e.g., what they are made of, whether they are comprised of atoms, etc.?

The only way to determine that the luminiferous ether does indeed exist is to physically detect it through experiments, which had evidently so far not been successful, instead of theorisation, and, since the experiments so far had not detected it, it could be concluded that the luminiferous ether does not exist (provided that the experiments had not been faulty).

However, the following important questions should be lavished with some consideration: How is light able to travel very long distances at the very great velocity of 186,000 miles per second in a vacuum? Is some very strong force, a yet unknown, undetected, force, perhaps, a very strong, very high frequency, carrier wave (similar to the above-mentioned carrier signal), which might be interpreted by some as the medium of transmission, carrying light along? Or, is the movement of light entirely self-propagating, i.e., without the aid of any external force? Shouldn't the velocity of light be at, above and below 186,000 miles per second at various points in time, i.e., be variable, as clocks and watches, in fact all mechanisms, natural and artificial, do go faster or slower to varying degrees at various times, which explains why all equipment, including precision equipment, have to be calibrated from time to time in order that accuracy at the accepted level is maintained?

References

- [1] Concepts Of Modern Physics, Fifth Edition, McGraw-Hill, A. Beiser, 1995
- [2] SlipString Drive: String Theory, Gravity, And "Faster Than Light" Travel, iUniverse, Andrew L. Bender, 2006/2007
- [3] The Special Theory Of Relativity, Routledge, David Bohm, 1996
- [4] The Evolution Of The Physicist's Picture Of Nature, Scientific American, P. A. M. Dirac, May 1963
- [5] On The Electrodynamics Of Moving Bodies, Annalen der Physik, 17:891, Albert Einstein, June 30, 1905
- [6] The Meaning Of Relativity, Princeton, Albert Einstein, 2005
- [7] Faster Than The Speed Of Light: The Story Of A Scientific Speculation, Perseus, Joao Magueijo, 2003
- [8] Modern Physics (4th. ed.), W. H. Freeman Company, Paul Tipler, Ralph Llewellyn, 2002
- [9] An Aspect Of The Special Theory Of Relativity, The General Science Journal, Bertrand Wong, March 8, 2010
- [10] The Special Theory Of Relativity: A Special View, The General Science Journal, Bertrand Wong, March 8, 2010
- [11] The Special Theory Of Relativity: Further Views, The General Science Journal, Bertrand Wong, March 18, 2010