

# The Illusion of Light as Transverse Electromagnetic Waves

Keith D. Foote  
Ann Arbor, MI 48103

The interpretation of light as transverse waves is critically examined. 'Old information' is updated and combined with 'new information' and a new model is presented. The behavior of electromagnetic waves is examined and compared with that of longitudinal sound waves. Synchrotron and Cerenkov radiation are used as supporting evidence showing light waves are not transverse in nature, and are transported by a medium.

**The model of light as transverse waves is an error which has promoted an overall disintegration of the electromagnetic wave model, and has severely stunted research of the electromagnetic field. The error was initiated in 1814, and has distorted our understanding of physics to the point of denying the EM field's very existence.** 1814 was when Augustin Fresnel, experimenting with light passing through crystals, decided light was made up of transverse waves. Transverse waves involve up and down undulating waves and are typically associated with solid matter. Waves carried along a cracking whip, or the surface (tension) of fluids, with the up-down undulations passing through an up-down slit, are commonly used in describing Fresnel's experiments. Fresnel concluded the aether (the medium believed to transport light waves) must be an elastic 'solid'.<sup>1</sup> The aether model developed from these conclusions was of an invisible, jello-like substance distributed uniformly through matter and empty space, used for transporting light waves, and which matter moved through without detectable resistance. This evolved into the 'luminiferous aether'.

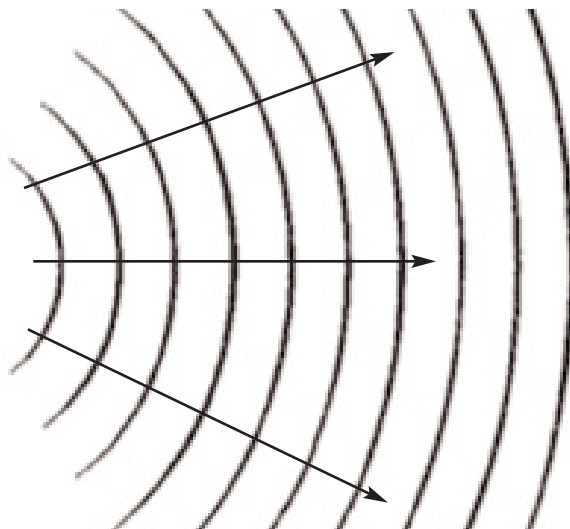
Longitudinal compression waves are rhythmic pulses of compression passing through a medium. Sound waves provide a good example.

Transverse waves, such as those presented on the surface tension of water or carried along a cracking whip, all require a surface area and energy directed at a right, or vaguely right, angle, causing an up down undulation of the material. In the situation of an explosion underwater, the compression waves are longitudinal. In solid matter, transverse waves are often initiated by an object striking the surface, such as a hammer striking the end of a metal bar at a vaguely, or exact, right angle.

Transverse waves representing the two dimensional surface of water, or a whip with its three dimensional surface exposed.



Longitudinal compression waves, which do not require a surface area, spread outward three dimensionally through the medium. This behavior is expressed by both sound waves and EM waves.



I can find no external surface area for the electromagnetic field. There are objects/ surface areas within the EM field, but that's not the same thing. To the best of my knowledge, the electromagnetic field extends endlessly in all outward directions. There does not seem to be a surface area available for light to be expressed as transverse waves, nor any method by which energy could be transferred at a right angle to the missing surface.

The claim has been made electromagnetic waves do not require a medium for transport. The claim is originally sourced from Einstein's declaration the aether was no longer necessary (...for mathematical equations). This declaration was deliberately misinterpreted by particle physicists with the agenda of promoting photons.

(A version of Newton's corpuscles. Einstein was essentially a Newtonian in his youth, with no interest in the aether until later in his life, around the time he stopped being supported by particle physicists.) Synchrotron<sup>2</sup> and Cerenkov radiation<sup>3</sup> provide evidence of the invisible aether by way of resistance and a close imitation of the sonic boom created by jets as they pass the speed of sound. (Remember, we can't see the air we breathe, either. Does that mean it doesn't exist?)

Three dimensional electromagnetic compression waves are typically created by moving electrons. (Moving protons and positrons also generate EM waves.) A moving charged (or magnetic) field produces "compression waves" which move ahead of it, until it accelerates to the speed of light (within the medium). These EM waves are synchrotron radiation. Faster than light speeds produce Cerenkov radiation.

Accelerators are used primarily for particle collision experiments, but some research focuses on synchrotron and Cerenkov radiation. Synchrotron and Cerenkov radiation are events unsupported by, and unexplainable using, Einstein's Special Theories. They provide evidence electrons move through a medium which transports light. As the electron (or a charged/magnetic entity) accelerates, light waves form in front of it, becoming broader as the speed increases. As the electron passes the allowed speed of light (for the local medium), the radiated EM pulses become the electron's wake, moving to the sides and 'behind it'. As the electron continues to accelerate, the wake narrows, taking on a cone shape. As the electron moving faster than light 'slows', the process is reversed, with the wake broadening and moving forward, until it again becomes synchrotron waves, continuing to move forward.

The sonic boom created by a jet accelerating to faster than the speed of sound is emitted as its of sound waves, with a cone of sound waves, with a cone of sound waves moving to the rear as the jet continues to accelerate. As an electron or positron accelerates to faster-than-light speeds, it displays the same behavior using EM waves. Synchrotron and Cerenkov radiation provide hard supporting evidence light is not made up of transverse waves and that light travels through a medium.

Additional support for the concept of light traveling through a medium includes the blueshifting of light as it approaches a gravity field. Einstein's model predicted a redshifting of light with no detectable change in the speed of light. The speed of light actually slows and blueshifts as it enters Terra's gravity field.<sup>4</sup> The medium

transporting EM waves is condensing with proximity to the gravity core, in turn blueshifting the frequency and slowing the speed of light. (The same thing happens more abruptly when light shift from the thinner EM field of a vacuum to the denser EM field of air, or glass. With these observations, one can conclude the aether/electromagnetic field has a weak gravitational pull, which can in turn be used to explain dark matter. (Aether=dark matter) The density of the medium/EM field controls the speed of light, with gravity condensing the medium, and the electromagnetic field slowing and blueshifting light.

Terra becomes a self-contained environment, with the density of the medium controlling the speed of light. Expanding on this observation, light would travel more slowly on Jupiter, than it would on Terra. The Michelson-Morley experiment failed because they were expecting an aether uniformly distributed through matter and empty space, with the speed of light consistent, regardless of the medium.

The error Fresnel made in 1814 was projecting the characteristics of transverse waves onto polarized light. In the Ultra-Space Field Theory model, polarized light waves are not described as transverse, but as electromagnetically aligned. The medium within Fresnel's crystals is electromagnetically aligned and only EM wavelets/quanta from sources with similar alignments can pass through. A quantum transports alignment characteristics from the previous host oscillator to the next. If the next oscillator is free, or loose, as in outer space or our atmosphere, it accepts the alignment changes. If the next oscillator is held in position, the alignment characteristics are not transported, but filtered out. In Fresnel's experiments, the crystal acts as a filter. After leaving the crystal, and passing into free or loose thermons, this 'filtered' light transports the alignments and patterns until new interference distorts or blocks them. (Thermons are joined electron/positrons which act as the foundation for the aether/electromagnetic field, per the Ultra-Space Field Theory.<sup>5</sup>)

It was assumed the light waves themselves were polarized. This assumption has not been questioned in recent decades because of claims electromagnetic waves do not require a medium. (Mystical behavior? Confusion and chaos? A model with a gaping hole? Fear of political and career suicide by supporting the old fashioned wave model?) It is not that the waves are polarized, but that the quanta (bits o' kinetic energy) supporting the EM waves transport polarization from one thermon to the next. (By the way, photons, as massless, chargeless particles that exist only while traveling at the speed of light through a vacuum -sometimes the vacuum between molecules/atoms-, do not provide any explanation for polarized light.)

In the USF theory model, polarization is treated as the electromagnetic alignment of thermons, the underlying transport system of EM waves. This may seem a subtle difference, but the electromagnetic waves are no longer required to be transverse if units of the medium are subject to polarization. The waves once again become longitudinal, compression waves and the electromagnetic field no longer has the characteristics of jello projected onto it (or the more extreme case, where its existence is simply denied and electromagnetic waves are flippantly described as not requiring a medium for transport).

For purposes of understanding, the behavior of sound waves will be examined and compared with the behavior patterns of electromagnetic waves. Sound, as compression waves, travels through all forms of matter (though waves can also be dampened and blocked by forms of matter, particularly foam materials). The matter transporting the sound waves is called the medium. The medium dictates the speed of the sound waves. Sound cannot be detected traveling through a vacuum.

Sound waves/electromagnetic waves share the following behavior traits:

- \* Frequency
- \* Wavelength
- \* Amplitude
- \* Intensity
- \* Can expand in all directions or be reduced to a beam.
- \* Higher frequencies spread out less quickly than lower frequencies (for this reason, there was a failed effort in the 1950s to assign photons (particles) to x-rays and gamma rays, and wave behavior to infrared and radio waves.
- \* Interference
- \* Doppler effect/Red & Blue Shifting
- \* Reflection,
- \* Refraction
- \* Diffraction
- \* Cerenkov radiation/Sound barrier

The Ultra-Space Field Theory provides a highly useful model of the medium supporting the electromagnetic field and electromagnetic waves. Planck's model of 'oscillators' transporting units of kinetic energy, called quanta, is expanded upon. Planck's oscillators are made up of joined electron-positrons, creating ultra-subatomic, coulombic (electric) black holes.

## References

[1] 'Principles of Physical Science', Francis T. Bonner & Melba Phillips, Addison-Wesley Publishing Company, Inc, pages 360-1 or 'Physics For Scientists and Engineers, With Modern Physics', Douglas C. Giancoli, Second Edition, Prentice Hall, 1989, pages 826-835 (I couldn't find any good descriptions of light as transverse waves on the internet, which may be due to its uselessness as a functional model.)

[2] 'Synchrotron Radiation' @ [hyperphysics.phy-astr.gsu.edu/hbase/particles/synchrotron.html](http://hyperphysics.phy-astr.gsu.edu/hbase/particles/synchrotron.html)

[3] 'Cerenkov Radiation' @ [www.britannica.com/EBchecked/topic/109373/Cherenkov-radiation](http://www.britannica.com/EBchecked/topic/109373/Cherenkov-radiation) --- Britannica Online Encyclopedia

[4] 'The Physical Foundations of General Relativity', Sciama, D.W., Doubleday & Co., 1969, pages 44-53

[5] K. Foote, Ultra-Space Field Theory, pp 85-87, 237- 239, Cosmos Books, Ann Arbor, 2005.