

Light Transmission, Reflection and Refraction as Scientific Evidence of God

Henok Tadesse
Email: entkidmt@yahoo.com

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Abstract

The microscopic mechanism underlying transmission of light in transparent media is still unknown. The Ewald-Oseen extinction theorem is an attempt to explain it mathematically but not very convincing. In this paper, we present a new explanation to the phenomena of light transmission in transparent media and light reflection.

Introduction

The behavior of light has perplexed scientists for centuries, despite the apparent advance in theoretical physics. For example, the constancy of the speed of light in vacuum is still a subject of debate and is confusing researchers and laymen alike, more than a century after it was proposed by Albert Einstein. If the nature and behavior of light in vacuum is still not fully understood, how can one hope to completely understand the behavior of light interacting with matter ?

Transmission of light in transparent media

One of the less understood light phenomena is the transmission of light through transparent media such as glass and water. We know that light travels in glass with a speed less than its vacuum speed, by a factor of the refractive index (n) of glass. However, when one tries to understand this phenomenon microscopically, one finds no way to figure out an explanation. As the Wikipedia article [1] describes it, the wave inside the glass is a superposition of the incident wave and the wave emitted from electron oscillations (due to their interaction with the incident wave). Both waves individually propagate at the vacuum speed of light (c), but the only wave known to be propagating through the glass is one with a reduced speed (c/n). There is no logical way of understanding why two waves with velocity c interfere to create a resultant wave with velocity c/n .

The Ewald-Oseen extinction theorem attempts to explain this mathematically, but not convincing. A number of authors have expressed this. A paper[2] describes the dissatisfaction of the author with this theorem.

“ . . . The Ewald-Oseen theorem resolves this paradox by showing how the oscillating electrons conspire to produce a field that exactly cancels out the original beam everywhere inside the medium. The net field is

Electrical engineer, BSc, Debrezeit, Ethiopia, Mobile:+251 910 75 13 39
Alternate email: wchmar@gmail.com

indeed the sum of the incident beam and the radiated field of the oscillating electrons, but the latter field completely masks the former.

Although the proof of the Ewald-Oseen theorem is fairly straightforward, it involves complicated integrations over dipolar fields in three-dimensional space, making it a brute-force drill in calculus and devoid of physical insight. “

One can also see that the Ewald-Oseen proof is based on classical Maxwell’s equations, which are basically based on the ether. The proof treats light as a classical phenomenon (ether), but we know that light is a quantum phenomenon, according to which a photon is only absorbed by a single electron.

Also light passing through transparent media is transmitted almost completely unchanged (in wavelength). Some authors have described this as a “miracle”.

Another article [3] describes the problem as follows:

“ If windows are made of zillions of randomly arranged excitable molecules, then windows cannot be transparent. That's what I would predict.

The first optical miracle is that windows are transparent. “

Other articles[4][5] express similar ideas, respectively:

“ . . . the "miracle" by which the radiation from many induced molecular dipoles conspires to produce a single wave propagating at the reduced speed . . . “

“ . . . The convoluted combination of reflection and transmission explains why light moves more slowly through solids than through the air or through a vacuum. “

The Wikipedia article [1] expresses similar ideas:

“ When light traveling in vacuum enters a transparent medium like glass, the light slows down, as described by the index of refraction. Although this fact is famous and familiar, it is actually quite strange and surprising when you think about it microscopically. “

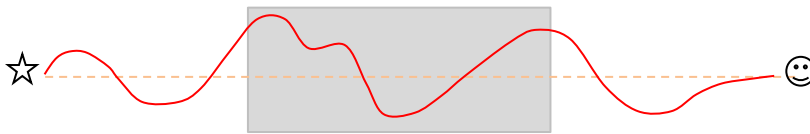
“ . . . Yet when the waves are added up, they surprisingly create *only* a wave that travels at the slower speed. “

Transmission and refraction of light in transparent media as scientific evidence of God

This author has proposed a novel theory [6][7] underlying quantum phenomena such as the photon/electron interference patterns in double-slit experiments, the “Which-Way” experiments, “wave function collapse” and quantum entanglement. The new theory proposes a new *internal dynamics* of quantum particles such as electrons and photons.

According to the new theory, each photon in a double-slit experiment is aimed at a particular point on the detecting screen, at the instant of light emission. The *initial conditions* of each photon is *fine-tuned* at the instant of emission, so the path of the photon is predetermined at the instant of emission.

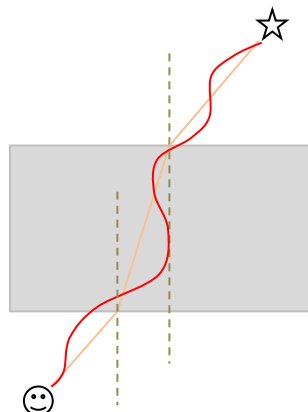
This same theory can be applied to explain the phenomenon of transmission of light through transparent media, such as glass, and the refractive index. The initial condition of each photon is fine-tuned at the instant of emission, so the photon follows a curved path while passing through the glass. The path length of the photon is such that it is exactly as if the speed of light in the glass has reduced by a factor of the refractive index of glass.



The new theory predicts that light generally travels in curved paths and hence the measured speed of light is only the average value, whether in vacuum or in transparent media. Light travels in straight line only on average. The instantaneous velocity of light can be subluminal or superluminal. This unconventional behavior of light is *fundamentally inaccessible* to experiments.

This raises the question : what/who fine tunes each photon at the instant of emission? God fine tunes the *initial conditions* of each and every photon emitted in the universe so that light behaves in the way we know it to behave in the different light speed and quantum experiments.

The same theory applies to refraction of light, as shown below. Note that the orange line shows the conventional path of light and the curved line path shows the actual path of light.



Reflection of light

Basically, a similar argument as above applies to the phenomenon of light reflection from a mirror. It is well known from classical optics that the angle of incidence is equal to the angle of reflection. Again, the standard explanation for this is classical, basically based on ether theory, which is implicit in Maxwell's equations. But we know that photons and electrons are quantum particles, and a photon incident on a reflective surface is absorbed and re-emitted by a single electron. With this view, it is not clear why the angle of incidence and reflection should be equal.

In this paper, a new explanation for light transmission in transparent media and light reflection is proposed.

Glory be to God and to His Mother, Our Lady Saint Virgin Mary

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