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A New Theory of Polarization of Light

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Abstract

Recent experimental findings prompt for a new explanation of the phenomenon of polarization of light. This theory has been called by the author "wave-front fragmentation theory of polarization" and is presented in the following short communication to the readership of General Science Journal.

1. About light

Light travels in beams and beams have a certain cross-section (the cross-section of a beam of light is not zero). The wave-fronts of the waves in a beam of light can be as great as the cross-section of the entire beam.

2. What happens when light passes through a polarizer

When a beam of light passes through a polarizer, the wave-fronts become fragmented by the polarizer. At the exit from the polarizer, the wave-fronts that were absorbed by the molecules of the polarizer are missing from the beam. The result is that the emerging beam is composed now of waves that have their wave-fronts fragmented in the direction of the polarizer - this is what is called "polarized light".

3. What happens when light passes through a second polarizer

When the "polarized light" passes through a second polarizer, the wave-fronts of the waves in the beam are again fragmented by the molecules of the second polarizer. If this second polarizer is crossed with respect to the first, the wave-fronts are fragmented in the highest degree and the emerging beam has a small intensity. This implies that crossed polarizers can never extinguish totally a beam of light: there will always be light passing through a system of crossed polarizers.

4. Experimental support for this hypothesis

Experiments show that the intensity of the light passing through two successive crossed polarizers is not exactly zero: there is always some light passing *even when the polarizers are crossed*. This is in contradiction with the present theory of light which considers light as a transverse wave that cannot pass through a system of two crossed polarizers.

The ratio of the intensity of light passing through crossed polarizers to the amount of light passing through parallel polarizers is called "extinction coefficient". This has been described (see http://www.lenstip.com/115.3-article-Polarizing_filters_test_Test_procedure.html) as a quantity which says how good a polarizer is.

The coefficient of extinction can be "about 1/10000-1/200000 for crystal polarizers, and roughly 1/100-1/5000 for foil ones." (see the same web site).

4. Implications of the present hypothesis

The present hypothesis opens the way for reconsidering the theory of light as a compression wave in the aether.

Light has been postulated a transverse wave because this was the only way to reconcile its wave properties with the fact that it is blocked by two crossed polarizers.

In the view of the experimental findings cited above showing that two crossed polarizers never really extinguish completely a beam of light, it follows that light needs not be considered a transverse wave because even a compression wave can be "polarized" through the fragmentation of its wave-fronts by the molecules of a polarizer.

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