

The Sagnac effect and the transparency medium

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In 1913 Sagnac published the result of an experiment entitled: “On the proof of the reality of the luminous aether by the experiment with a rotating interferometer” [1]. A beam of light is split and the two beams are made to follow the same path but in opposite directions fixed on a rotating apparatus, exhibits a temporal shift to the reception of the luminous signals. In 1905 Einstein have claimed: “One will see that the introduction of “luminous ether” becomes superfluous as the result of our conception that does not any use an “absolute space at rest” [2]. In this work Einstein was proposing an explanation of the failure of the experiments of Michelson and Morley to establish the relative motion of the earth to the Ether [3]. The experiment of Sagnac has been many time repeated but still remain today difficult to understand considering the special relativity [4].

To understand these different phenomenon it is important to be able to describe how the light cross the transparency medium. The classical description of this property is given in Wikipedia: *the transparency: designates the capacity of a material to do not interact with a wave. In the case of the optics, a transparency material has the property to do not absorb the light. This property of a material depends nerveless of the wave length.* Thus if we suppose that the light is moving in a wave process we have to face the Ether and its difficulties.

The difficulty is the result of our most classical description of the ionic structure of the transparency medium, making obstacle to this approach. In this approach the valence electrons of the metal are supposed to be captured by the metalloid atoms to have a full shell. But since the discovery of the rare gas compounds call inert [5], this hypothesis cannot be justified, since a full shell can gives compounds [6]. The comment of Chernick about the difficulties to change of approach is reproduced with the reference [5]. As a result the atoms of a pure metal or those of a transparency medium are able to absorb the photons of the light. These ones are absorbed by electrons during a short time depending of the energy of the electron after absorption. That one determines the stability of these electrons and yet it is not the same according to the sens of propagation of the photons in respect of the transparency matter, thus the temporal shift to the reception of the luminous signals. The difficulties to understand the Sagnac effect disappear as those to understand the interferences with the photons [7].

References

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- [3] Michelson, Albert A.; Morley, Edward W. (1887). "On the Relative Motion of the Earth and the Luminiferous Ether". American Journal of Science. 34 (203): 333–345.
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