MEASUREMENT OF ONE-WAY SPEED OF LIGHT

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Abstract: Wave theory of light was tested by the Michelson's interferometer, whereas Newtonian corpuscular theory can be tested with the new interferometer, which can show whether the speed of light in empty space is variable during Doppler effect. Such measurement is possible due to the effect of Fizeau.

Introduction.

According to Special relativity, the basic physical quantities are relative, and the light-speed (LS) in empty space is a universal constant. But time and space are not equivalent and doesn't compensate each other, so if they are relative, then the LS in vacuum should be variable with respect to observer, because this speed is their derivative. Besides, on electromagnetic induction, where electrical charges are generated, the motion is absolute. Consequently probably LS in vacuum is variable in the Newtonian sense.

1. Variable speed of light [1-3]**.**

When an observer measures the relative speed between two independent lateral objects, he may find even superluminal speed for them. For example, if an observer broadcast in opposite directions two objects moving at the speed of light with respect to him, then he will calculate that the relative velocity between objects is equal to twice LS. This result is a classical fact.

As we know, the visual simultaneity of two optical phenomena is relative and depends on the speed of the observer, because light from the approaching event outstrips that of receding event. Consequently, light can travel equal distance with different speeds, i.e. its speed is variable.

In empty space, light radiated ahead from moving inertial source, always outdistance it significant with respect to observer, which phenomenon happens at ultra-fast galactic jets, as well as at solar protuberance. Consequently, the speed of this light is increased toward observer, whereas is constant with respect to the source. This partly confirms the Newtonian corpuscular theory.

2. Photon's wave-corpuscular transformation.

As we know, photons have wave-corpuscular nature, but in a transparent material environment they behave more like waves, such as at dispersion, and in empty space photons behave more like particles, such as at external photoeffect. Consequently, photons are not identical in these two situations, and if photons transit from one situation to other, they transform itself. This means, that the wave theory of light does not contradict the Newtonian corpuscular theory, whereas they are limited and apply to different situations. If this is true, then in empty space is valid corpuscular theory of light. This theory has no contradictions with classical physics in empty space.

According to Newton's theory, the LS in vacuum is constant only with respect to light-source if it is inertial, otherwise the LS is variable and consistent with the classical law of velocities composition. This contradicts to the Special relativity, but is likely to be true and can be verified experimentally.

3. Newtonian asynchronous interferometer [4]**.**

If the LS in vacuum is variable according to Newtonian theory, then during Fizeau effect must happen transformation between speed and frequency of the photons, while their energy reserves. This frequency-speed photonic transformation can be shown by the asynchronous interference, which would prove that the LS is variable in proportion to the Doppler effect.

One possible variant of asynchronous interferometer is as follows. Moving inertial light-source radiates ahead a wide cylindrical laser beam, which falls within the static receiver, composite of flat glass plate, almost flat conical lens and plane screen, arranged consecutively along the beam axis. All diameters are equal, and the thickness of the plate and the lens exceeds the wavelength of the beam. When the entire system is coaxial, on screen will appear interferential picture of concentric circles, i.e. rings. If corpuscular theory is correct, then at inclined plate with respect to the beam, on the screen will appear two mutually dephased semi-circumferences composed of semi-circles, i.e. arcs instead of rings.

The reason for the above result is, that the plate acts as an asynchronous frequency-speed photonic transformer, so the photons travel the same routes as a whole, but they have different average speeds and frequencies, for that reason one side of the beam is dephased compared to the other. Besides, no matter what is the distance between the source and receiver.

Since the entire system must be coaxial to function properly, it can be monitored through an additional interference. For its realization, we must reduce the diameters of the plate and screen, and have to add another screen after the first. Thus, the peripheral part of the beam passes over the plate and the first screen, then falls on the second screen. So, when there is coaxiality in the system, then on the second screen will appear a ring, regardless of the picture on the first screen, because the light from the ray's periphery is not asynchronously dephased.

Besides described interferometer in Fresnel style, we can also make more compact version in Jamin style. In this case, the apparatus should have two identical thin parallel rays instead of one large, and two separate plates, one for each beam. These plates stands transversely to the rays and are located at different distances from the source. After the plates there is Jamin's double mirror, which bends the two beams at right angles, collect them and directs them to the screen. The two beams leaving the mirror coaxial, so the distance to the screen is minimal, therefore the size of this apparatus will be smaller.

To calculate the magnitude of dephasing between the two beams on the screen, we need to know the longitudinal distance L between the two plates, as well as the relative speed V of the source toward the receiver. Moreover, we also need the secondary transformed wave-length $Л$ of the rays, and the constant speed C of light with respect to its secondary source - the transparent plates. With these quantitys, during blue Doppler effect, we can determine dephasing D by the formula:

$$D = ((L.V)/(Л.C)).100\%.$$

For example, if $Л$=450nm, V=10m/s, L=5m and C=3.10^{8}m/s, then D=37%, which value is enough to be detect.

Conclusion.

Likely LS in empty space is variable in Newtonian sense. This can be verified experimentally, for example with suggested interferometer.

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