EXPERIMENTS SHOWING DISTURBANCE OF THE PRINCIPLES OF RELATIVITY, EQUVALENCE AND ENERGY CONSERVATION (workshop)

OPTICAL MEASUREMENTS OF THE ABSOLUTE VELOCITY OF THE EARTH

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(*Translated from Russian by Stoyan Sargoytchev*)*

Abstract A few experiments, which confirm the validity of Absolute space-time theory against the Einstein's theory

In all (*presented here*) experiments for measurement the velocity of light, one measures the sum of the module of velocity components in two opposite direction. It is obvious that the average velocity will be constant (equal to the velocity of light) even if the velocities in the opposite directions are different.

Fig. 1 (*removed due to obviousness*) shows a typical (*known from the prior art*) experiment for measurement of the velocity of light. The light from a source S passing through the semitransparent mirror N, is cut in patches by the teeth of the rotating wheel C. The light patches pass the distance *d* to the mirror M and reflected back pass again through the teeth of the wheel C, then reflected by the semitransparent mirror N, arrive to the observer O. If for the total travel time, the wheel is rotated for one tooth, the observer will not see a light. Then the velocity of light is obtained by dividing the total light path 2d on the time the wheel rotates on one tooth.

The described experiment (Fig. 1) has been done for the first time by Fizo in 1849. Presently, thousands of radars operate on the Earth, but nobody (I repeat emphasizing - nobody) took effort to measure the velocity of light in this way, despite the fact that such experiment has been proposed by Michelson and Morley in 1887, after observing a null result by the Michelson interferometer.

The arrangement of similar experiment is so simple that even a child, who understands the Fizo experiment could guess. Although, strangely enough, nobody in the world did not undertake such experiment, despite the fact that the technical difficulties are not so many.

Fig. 2 illustrates the experiment by which I measured the difference of the velocity of light between two opposite directions [5, p. 68]. The light from a laser is divided in two beams by a semitransparent mirror. Then, after been reflected by other pairs of mirrors, they travel in opposite directions between two synchronously rotated disks C1 and C2 with holes near their periphery (in Fig. 2 the two beams are shown as emitted by two sources). The light cuts in patches by the say first rotating disk C1. The rotating disk C2 (additionally shortening the patches) transmits a comparatively more light if the light velocity in this direction is larger or less light if the light velocity is smaller. The distance between the two disks could no be very large (*for a laboratory experiment*) (Fizo used a distance of 8 km), so the difference between the light patches durations for both directions will be very small. Although, if using sensitive *(high speed*) photodiodes, one may determine the velocity vector of the absolute motion of the laboratory as vector component along the light path axis *(defined by the shaft on which the disks are mounted)*. Following is the whole theory and experimental setup *(with results)*.

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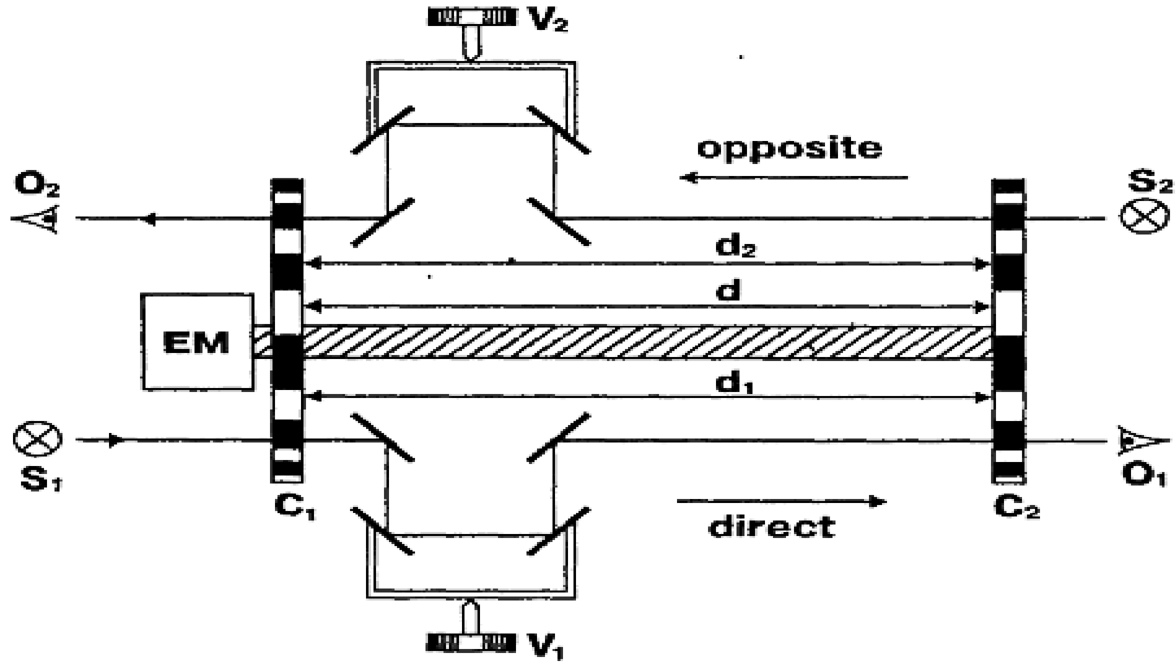

Fig. 2. Coupled shutters experiment for measurement of the light velocity in one direction

The shaft is rotating by the motor put at the middle (on Fig. 2 the motor EM is shown at the left side). The distance between the centre of the peripheral holes and the axis of rotation is 12 cm, while the distance between the two disks is 120 cm. The mutual angular position of the two disks is such that when in rest the light passing through a whole width of the hole of one disk (*assuming a beam width equal to the hole's width*) enlights the half width of a hole of the other disk. The light patches cut by anyone of the disks (*when rotating*) must travel a finite time until reaching the other disk, so if the rate of rotation is increasing, a less and less light will pass through both disks. (If the cosine of the angle between the shaft axis and the vector of the laboratory motion through the absolute space is small, the two light patches arriving at the observers O1 and O2 will get a slightly different widths. (This difference will be larger for larger rotation rate and distance *d*). Let for convenience denote the hole in the left-hand wheel "escaping" and in the right-hand wheel - "approaching".

Let us admit that the wholes are rectangular, i. e. the laser beams have a rectangular section and uniform light distribution in that section (this considerations, used for simplicity, do not affect the final expressions, if the beams are ordinary laser beams). The current *I* generated in each photodetector will be proportional to the width of the light patch, *b*, when the shaft is rotating, i. e. *I~b.* When the rate of rotation is increased on $\Delta N\ RPS$, the width of the light patch at the "escaping" whole will become $b-\Delta b$, while at the "approaching" hole it will be $b+\Delta b$. The corresponding currents will be respectively proportional $(I-\Delta I)\sim(b-\Delta b)$ and , $(I+\Delta I)\sim(b+\Delta b)$ so we have

$$db = b(dI/I) \qquad (42)$$

where: dI - is the half of the current difference measured from both photodetectors.

If rotating initially the shaft with the disks in one direction with a speed of $\Delta N/2\ RPS$ and after that in the opposite one with a speed of $\Delta N/2\ RPS$, this corresponds to a change of the angular velocity by $\Delta N\ RPS$, so we have

$$db = (d/c)2\pi(\Delta N)R \qquad (43)$$

(where: R – is a distance between the holes and center of the disk, c – is the velocity of light)

Then for the velocity of light in one direction we get

$$c = \frac{2\pi(\Delta N)Rd}{b}\frac{I}{\Delta I} \qquad (44)$$

If the velocity of light in one direction is c-v, while in other is c+v, then the current changes (due to ΔN) will be respectively, $(dI + \delta I)$ and $(dI - \delta I)$ and we will have

$$c - \upsilon = \frac{2\pi(\Delta N)Rd}{b}\frac{I}{\Delta I + \delta I} \quad ; \quad c + \upsilon = \frac{2\pi(\Delta N)Rd}{b}\frac{I}{\Delta I - \delta I} \qquad (45)$$

.

From these two equations we get the final result:

$$\upsilon = (\delta I/\Delta I)c \qquad (46)$$

The method of measurement of the currents ΔI and δI is following. One changes the rotational speed of the shaft by ΔN (400 RPS) and measures the current change $\Delta I \sim (\Delta I \pm \delta I)$, for each detector. After that, one measures the difference between both changes of the currents. I use a differential way for measurements the current difference by putting the currents from both photodetectors through a galvanometer. In order to measure $2\Delta I$, I arranged the disk in a way that the far holes for one disk are "escaping" but for other - "approaching". In order to measure $2\delta I$, I arranged the disk in a way that both beams are either "escaping" or "approaching". (*In fact instead of changing the RPS he uses a constant 200 RPS, but rotating once clockwise and then counterclockwise, in which way the expressions (45 are valid*).

The measurement of the current difference ($2\Delta I$) I did once obtaining $2\Delta I = 105\ \mu A$. The measurement of the current difference ($2\delta I$) I did from 9th to 13th February 1984 in Graz (Austria, $\varphi = 47^0$, $\lambda = 15^0 26'$), taking data every 2 even hours. Since I did the experiment alone, some hours in some days are omitted. The instrument shaft has been aligned in a North-South direction. For these five days I obtain a quasi-sinosoidal curve with two maximal current differences $(2\delta I)_a = -120\ nA$ and $(2\delta I)_b = 50\ nA$) for the standard time hours, t_{st}, which (together with the estimated probable errors) corresponded to two maximal projections of the absolute velocity of the Earth along the axis of the instrument for twenty-four hour period:

$$\upsilon_a = -342 \pm 30\ \ km/s\,, \qquad (t_{st})_a = 3^h \pm 1^h$$

$$\upsilon_b = +143 \pm 30\ \ km/s\,, \qquad (t_{st})_b = 15^h \pm 1^h \qquad (47)$$

When $2\delta I$ has extremum, the absolute velocity of the Earth lie on the plane of the laboratory meridian (Fig. 3). The velocity components pointing to North are assigned positive, while components pointing to South - negative. I marked by υ_a , the velocity component with the smaller module. When the two beams pass through the "escaping" holes, then if the absolute velocity component points to North, the "north" photodiode generate less current than the "south" one (in respect to the case when the absolute velocity component is perpendicular to the instrument axis). It is necessary to mention that in Fig. 3 both velocity components are shown as positive, pointing to the North, but in fact the component υ_a was negative.

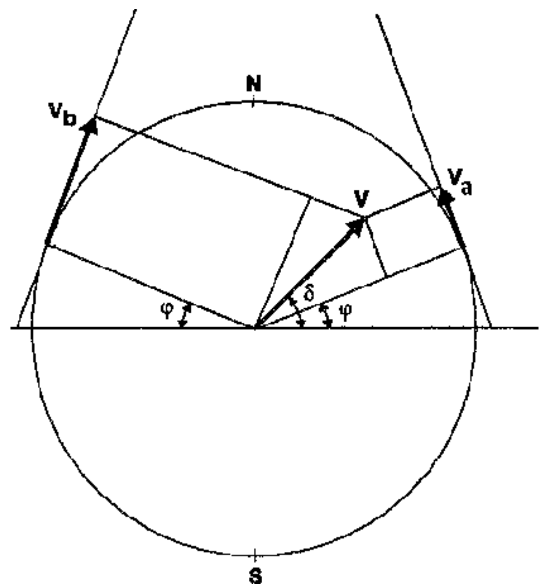

Fig. 3 The absolute velocity of the Earth and the vector components in the horizontal plane at the moment when the absolute velocity is parallel to the meridian plane.

It is evident by Fig. 3 that both velocity components of the Earth in the horizontal plane of the laboratory, υ_a and υ_b a related to the module of the absolute velocity by the equations

$$\upsilon_a = v\sin(\delta - \varphi), \qquad \upsilon_b = v\sin(\delta + \varphi) \qquad (48)$$

where φ is the latitude of the laboratory and δ is the declination of the velocity's apex. From this one obtains

$$\upsilon = \frac{\left[\upsilon_a{}^2 + \upsilon_b{}^2 - 2\upsilon_a\upsilon_b(\cos^2\varphi - \sin^2\varphi)\right]^{1/2}}{2\sin\varphi\cos\varphi} \qquad (49)$$

$$\tan\delta = \frac{\upsilon_b + \upsilon_a}{\upsilon_b - \upsilon_a}\tan\varphi$$

Obviously, the apex of the absolute velocity points to the laboratory meridian. Consequently, the right ascension of the apex will be equal to the local sidereal time of registration of υ_a. Since, the time accuracy of the υ_a was +/- 1 hr, it was enough to calculate with accuracy no better than +/- 5 min) the sidereal time t_{si} of registration, taking into account that the sidereal time at a midnight is as follows:

22 сентября - 0h	23 марта - 12h
22 октября - 2h	23 апреля - 14h
22 ноября - 4h	23 мая - 16h

22 декабря - 6h	22 июня - 18h
21 января - 8h	23 июля - 20h
21 февраля - 10h	22 августа - 22h

The local sidereal time of registration of v_a, (i.e. the right ascension of the apex of the absolute velocity) was calculated by taking into account the local sidereal time at midnight on the February 11 (a date in the middle of my observational period, which appears 21 days after the midnight of January 21) was 8h+1h24=9h24m. At 3:00 central European time (the standard time of Gratz) on February 11, the local sidereal time at 15^0 meridian was 9h24m+2m=12h+26m~12.5h. This was the right ascension of the apex of the absolute velocity. Inserting the data from (47) into (49), I obtained the absolute velocity vector of the Earth in Equatorial coordinates (for the mentioned observational time period)

I must say at the end (see Fig. 2) that the coupled shutters experiment can be realized also by arranging deviated paths adjustable by micrometric screws V1 and V2, as shown in Fig. 2. and using a galvanometer as a null detector connected between both photodetectors. It is obvious that if we make the current through the galvanometer zero by adjusting the deviated paths, the total path lengths will be respectively, $d_1 = d + a$, $d_2 = d + a$, where a is the deviated path length. Then turn the instrument on 180 deg, in order to make the current difference again zero, we must change the paths to

$$d_1^{'} = d(1 - 2\frac{\upsilon}{c}) + a \qquad\qquad d_2^{'} = d(1 + 2\frac{\upsilon}{c}) + a$$

(Changing the path in fact changes the pulse duration of the light patches).

When the projection of the absolute velocity of the laboratory on the shaft axis is aligned from right to left (see Fig. 2) the change of one of deviated the paths by the micrometer screw is related to the velocity by the expression

$$\Delta d = d_2^{'} - d_1^{'} = 4(\upsilon/c)d \qquad (51)$$

For v=300 km/s and d=120 cm, the corresponding distance change by the micrometer screw is $\Delta d = 4.8\, mm$.

In 1973 in Sofia (Bulgaria), I did an experiment with rotated coupled mirrors [10]. It has not been accurate enough, so I measured only the maximum of the projected absolute velocity of the Earth along the instrument axis in the order of v=139+/-100 km/s. (The azimuth was 84 deg).

In 1975/76 in Sofia I did another experiment with coupled mirrors interferometer [11], which was much more accurate. Making measurements for 6 months, I obtained an absolute velocity of our Sun v=303+/-20 km/s for the apex of this velocity in equatorial coordinate system $\alpha = 13^h 23^m \pm 20^m$, $\delta = -23^0 \pm 4^0$.

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