Pioneer Anomaly and the Ether Wind

John-Erik Persson

Fastlagsvägen 2, 12648 Hägersten, Sweden

e-mail: john.erik.persson@gmail.com

This article presents a new interpretation of the Pioneer anomaly.

Keywords: Pioneer anomaly, ether wind, two-way light-speed.

Anomaly

Two spacecrafts, Pioneer 10 and 11, have demonstrated a very small reduction of speed in their motion in a radial direction out from our solar system. This represents a very small anomaly in relation to modern theories in physics. This phenomenon has been discussed for many years but has still not got a clear explanation. The effect has been detected by means of high precision, two-way Doppler measurements. A new interpretation is presented in this article. This new interpretation is based on an the assumption that apparent deviation is only an illusion. Instead of a decrease Δu in Pioneer speed the real effect is an increase Δc_2 in the two-way speed of light. This represents a change in local ether conditions. This is a confirmation of the existence of an ether, but is not in conflict with modern theories of gravity.

Two-Way Speed of Light

In [1] the two-way speed of light was described as $c_2=c\cdot(1-v^2/c^2)$ with v as the ether wind. Horizontal ether wind v is a very small translational effect of the rotation of our planet. In vertical direction the effect is greater and causes the force of gravity. The relation above is in agreement to Michelson's own prediction without the reduction that later was done by Stokes.

The vertical ether wind is negative and always directed towards the center of the celestial body producing the effect. The produced force is therefore constant and not moving in relation to its source although the effect is produced by ether particles moving in all directions. No aberration is therefore produced. If we assume individual ether particles to move with the speed $c,$ we conclude therefore that this speed only has relevance for *changes* in gravity. The magnitude of the ether wind is not known, but a preliminary *hypothesis* was declared in [1]. It was stated there, that the vertical ether wind was assumed to be equal to *the speed of a satellite in a circular orbit* around the body at the same altitude as the ether wind.

The earlier mentioned article [1] contains also alternative interpretations of the basic phenomena behind SRT. Magical illusions like time dilation, multiple time concepts and contraction of space are substituted by explanations based on physical mechanisms. The bending of light near our sun is also explained by the ether wind. SRT cannot do that.

Pioneer Observations

The orbiting speed of our planet is $v=10^{-4}\cdot c$. According to earlier given hypothesis we therefore get a two-way speed of light as $c_2=c\cdot(1-10^{-8})$ in vertical direction in relation to our sun. This is valid at a distance of 1 AU (astronomical unit) from our sun. At the distance r_{AU} we get $c_2=c\cdot(1-10^{-8}/r_{AU})$. Therefore we can find the change in f as $\Delta f/f=2\Delta u/c=2\Delta c_2/c=2\cdot10^{-8}/r_{AU}$. With a carrier frequency of $2\cdot10^9$ Hz we get $\Delta f=40/r_{AU}$ Hz. Assuming r_{AU} to change from 10 to 20 AU we finally find that the change of frequency is 2 Hz. This result can perhaps explain the Pioneer anomaly.

Verification

The second order effect of the ether wind in the Pioneer anomaly is very small. It is therefore of interest to detect the first order effect in a straight line as well. Sagnac has tested this effect in a closed line. R. Wang has demonstrated the effect in a straight line. However, he could only demonstrate artificially produced *changes* in speed in relation to the ether. de Witte [2] has tested a natural effect of first order in a straight line, but he could not change the direction of measurement and not measure in a vertical direction. This was caused by the long base for his measurement, which was necessary due to long wavelength. Dr C. C. Su [3] has suggested a scaling down of the equipment by the use of two HeNe lasers with short wavelength and very good frequency stability. The lasers are connected over a length of a few meters by fiber optics and their signals are compared in an interferometer.

The phase difference between the signals is registered when the direction of measurement is changed slowly inside a vertical plane. (If the direction is changed inside the horizontal plane the rotation of our planet can be detected, if precision is good.) The equipment *must* be mounted on a platform with very high mechanical stability.

Discussions

Second order effects of the ether wind have been searched many times during the 20th century, without results. Michelson and Morley's method, and variations of that method, have been used in horizontal (tangential) directions to our planet. This method was first suggested by Maxwell. Precision Doppler measurements in the Pioneer spacecraft provide a possibility to test second order effect in light speed in a direction radial to our planetary system. Pioneer observations are therefore important in relation to the two-way speed of light. Perhaps in the 21th century we will find what we could not find during the 20th century.

First order effects of an ether wind have been detected, but we have not seen a *natural* first order effect in a *straight* line. Detection of such an effect would give us a very certain confirmation of the ideas presented in this article. Dr Su [3] has described how this can be done in a horizontal plane. However, his ideas can be used in a vertical plane as well. It is therefore of great interest to do such tests.

References

[1]   John-Erik Persson,"The Falling Ether", *Proceedings of the Natural Philosophy Alliance 2013, available at* www.worldnpa.org/site/ Search on my name under 'Members'

[2]   Reginald T Cahill, "The Roland de Witte 1991 Experiment", *Progress in Physics V3, p60* (July 2016) available at www.ptep-online.com/index_files/2006/PP-06-11.PDF

[3]   John-Erik Persson,"Detecting an Ether-Wind of 10^-6 Based on Sagnac Effect", *General Science Journal* available at http://gsjournal.net/ See my name under 'List of authors'