the general science journal

Pioneer anomaly due to erroneous use of relativistic factor

Roger J Anderton
R.J.Anderton@btinternet.com

It's a convention whether light-speed (in vacuum) is constant, and has been not properly understood that and this has resulted in misuse of the maths of relativity and is here proposed that makes an anomalous acceleration of Pioneer crafts.

Pioneer craft has anomalous acceleration of (8.74 +/- 1.33) x 10^{-8} cm/sec^2 and speed of 12.24 Km/sec relative to the Sun. [1]

As pointed out to me - the funny thing is that the anomaly exactly equals to 1- $\sqrt{(1-v^2/c^2)}$ for v = 12km/sec (approx.) which is the speed of the Pioneer aircraft. [2]

It was noticed that:

$$1 - \sqrt{(1- (12x\ 10^3)^2/ c^2)} = 1 - \sqrt{(1- 1.6 \times 10^{-9})} = 1 - 0.999999999 = 8 \times 10^{-10}$$

using v = 12km/sec (approx.) which is the speed of the Pioneer aircraft.

And this value 8 x10^{-10} is close to the claimed value of the anomalous acceleration of (8.74 +/- 1.33) x 10^{-8} cm/sec^2 = (8.74 +/- 1.33) x 10^{-10} m/sec^2

So, it looks like they did the calculation incorrectly.

Especially since it connects to what I have been saying that the time dilation equation (and hence the relativistic factor) has been misunderstood/misapplied as per this year's ANPA talk. [3]

So, the claim is that "they" are building up a series of mistakes from the very beginning of relativity physics.

Thus, they are going to make mistakes such as have the anomaly exactly equals to 1- $\sqrt{(1-v^2/c^2)}$ for speed v = 12km/sec (approx.) of the Pioneer aircraft.

The 8 x10^{-10} from 1- $\sqrt{(1- (12x\ 10^3)^2/ c^2)}$ is a dimensionless (or unitless) number (i.e. without any physical units of acceleration m/sec^2). But it looks like they are also making the mistake of treating it as an acceleration 8 x10^{-10} m/sec^2 as part of their calculations.

Among the possibilities is that there is a mistake in the software they used which they couldn't identify, or they have wrongly included SR (special relativity) in the calculation. But both are really aspects of the same thing.

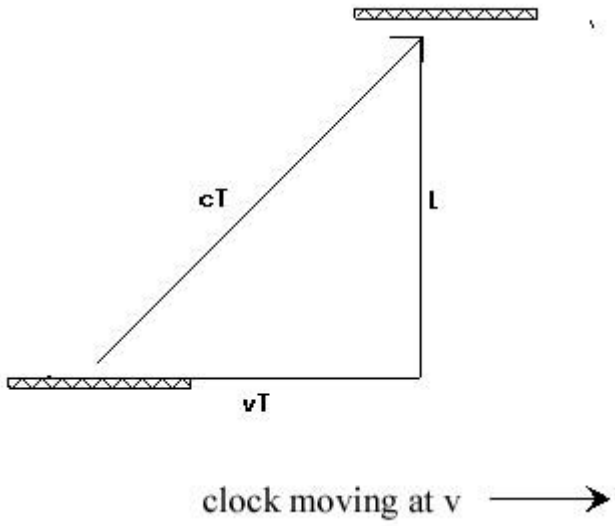
The Mainstream are under the wrong impression (as dealt with in my other articles) that as the relativistic factor $1/\sqrt{(1-v^2/c^2)}$ [4] tends to 1 when v tends to zero, and they then think from that SR approximates to Newtonian physics.

But really maths of SR was derived from maths of Newtonian physics, so have equality of the maths via $c'^2 t'^2 = (c^2 - v^2)t^2$ so can't have then one theory as approximation of the other.

I will briefly go through the maths again:

From Einstein going by speed of light as constant we can form the following maths [5]:

Now, we'll use our clock in a little experiment. Suppose the clock is in frame O' that is moving to the right in frame O with velocity v. What does an observer in frame O see. As the light leaves the bottom mirror, it and the mirror are observed to be travelling to the right with velocity v. Suppose



the light takes time T to reach the top mirror. Then both mirrors will have travelled to the right the distance vT, and distance the light will have travelled as observed by O, is cT, and, by the Pythagorean theorem $(cT)^2 = (vT)^2 + L^2$ so, $T^2 (c^2 - v^2) = L^2$ $T^2 = L^2 / (c^2 - v^2)$

$T^2 = L^2 / (c^2 (1 - v^2/c^2)) = (L^2 / c^2) (1/(1 - v^2/c^2))$

$T = (L/c)(1/\sqrt{(1-v^2/c^2)})$

taking $L/c = T'$ then this gives: $T = T' (1/\sqrt{(1-v^2/c^2)})$

i.e. by Einstein we have if speed of light is constant then clocks go at different rates- called time dilation.

However. if we let $L = c' T$ instead of $L = cT$' (i.e. we want the clocks to both be at the same rate) then

$T = (L/c)(1/\sqrt{(1-v^2/c^2)})$ becomes $= (c' T/c)(1/\sqrt{(1-v^2/c^2)})$ giving

$c' = c(1/\sqrt{(1-v^2/c^2)})$

So, if clocks go at same rate then speed of light is variable.

All been just a misunderstanding then of dealing with L= cT' when should have been dealing with L=c'T . This maths that they claim has been dealt with by experiments for L=cT' can be dealt with by L=c'T instead, and by so doing stay in Newtonian way of dealing with absolute time. I take similar steps for rest of Einstein's relativity and turn it all back to Newtonian physics.

Now with the Pioneer craft, they make this mistake with the relativistic factor and get what they think is an anomalous acceleration. To establish more precisely what they have done wrong (i.e. with their software) would take a more detailed analysis of their calculations.

References

[1] The Study of the Anomalous acceleration of Pioneer 10 and 11, Slava G Turyshev, John D Anderson, Michael Martin Nieto 2004
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CFAQFjAD&url=http%3A%2F%2Fwww.oca.eu%2FMignard%2FGrex%2FPresentations_pdf%2FGrex04_S_Turyshev.pdf&ei=ffKgUrDNG5GjhgeCjIHoDQ&usg=AFQjCNEt2Oyz3gxrTCA_y nxbPIdcpAtfug&sig2=apnMTVCHtPcCyhIc4Qrarg&bvm=bv.57155469,d.ZG4

[2] emails from Thierry deMees

[3] ANPA talk 2017 Omissions in Special Relativity , at:
https://www.youtube.com/watch?v=P5c3M_XIzeM

[4] There are two relativistic factors, γ and α, where $\alpha = 1/\gamma = \sqrt{(1-v^2/c^2)}$ ref:
https://en.wikipedia.org/wiki/Lorentz_factor 8 Sept 2017

[5] Calculus without tears: time dilation http://www.berkeleyscience.com/relativity.htm

original: c.RJAnderton5Dec2013

revised: c.RJAnderton8Sept2017

Revised because: I should have talked about things more accurately in the original 2013 edition and did not make things clear, especially about the relativistic factor being unitless.