

## Re: Why is the speed of light as it is

**Source:** <http://sci.tech-archive.net/Archive/sci.physics.relativity/2004-12/1283.html>

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**From:** The Ghost In The Machine (*ewill\_at\_sirius.athghost7038suus.net*)

**Date:** 11/28/04

Date: Sun, 28 Nov 2004 03:01:08 GMT

In sci.physics.relativity, Henri Wilson

<H@.>

wrote

on Sat, 27 Nov 2004 21:58:01 GMT

<upthq0lenvrnea7ck0mosul68c8e18v4ud@4ax.com>:

> *On Sat, 27 Nov 2004 05:00:06 GMT, The Ghost In The Machine*

> <ewill@sirius.athghost7038suus.net> wrote:

>

>> *In sci.physics.relativity, Henri Wilson*

>> <H@.>

>> wrote

>> *on Fri, 26 Nov 2004 21:05:53 GMT*

>> <dj6fq0d1s6dj13ubfng3hd10fgj0q1f23t@4ax.com>:

>>> *On Fri, 26 Nov 2004 04:01:18 GMT, The Ghost In The Machine*

>>> <ewill@sirius.athghost7038suus.net> wrote:

>>>

>>>> *In sci.physics.relativity, Henri Wilson*

>>>> <H@.>

>>>> wrote

>>>> *on Thu, 25 Nov 2004 21:20:27 GMT*

>>>> <u0j cq05h63dgo4gid163vm0aerjoe5nmrb@4ax.com>:

>>>>> *On 25 Nov 2004 03:13:50 -0800, fsegg@uaf.edu (Eric Gisse) wrote:*

>>>>>

>>>>>> *H@..(Henri Wilson) wrote in message*

*news: <450bq01v8n80aecu8cmunlo0t4tnvto7s5@4ax.com>...*

>>>>>

>>>>> [snippage]

>>>>>

>>>>>>> *How many times do I have to tell you that 'the speed of light' is*

>>>>>>> *a nonsense term.*

>>>>>>>

>>>>>>> *Speed must be specified relative to something else.*

>>>>>>>

>>>>>>> *Now, have you learnt anything today Geese?*

>>>>>>>

>>>>>>> *That answering my simple request is harder than making up*

>>>>>>> *bullshit non-sequiturs?*

>>>>>>>

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>>>>>If you can't do it, just say so.  
>>>>>  
>>>>> Geese. Please tell our 'failed-first-semester' friend Evens what you have  
>>>>> learnt from me today.  
>>>>> He doesn't understand either.  
>>>>>  
>>>>> There is no 'speed of light'.  
>>>>> There is no 'speed of anything'.  
>>>>>  
>>>>>  
>>>>>Tell that to the friendly traffic cop on the motorbike next time  
>>>>>he flags you for speeding. We'll wait... :-)  
>>>>>  
>>>>> Ghost, will he be interested in my speed wrt the road or  
>>>>> wrt alpha centauri?  
>>>>>  
>>>>>  
>>>>>The Earth road, of course.  
>>>>>  
>>>>>I should mention that one's speed can be measured via lightwaves;  
>>>>>the method involves pointing a "radar gun" and measuring the  
>>>>>frequency change of the returning waves.  
>>>>>  
>>>>>Assuming a frequency of 24.050 GHz and a speed of 30 m/s ( $10^{-7} c$ ,  
>>>>>about 67.1 mph or 108 kph), the frequency shift should be  
>>>>>approximately 2405 Hz; in any event field calibration does not  
>>>>>look to be overly difficult, given a discriminator similar to  
>>>>>those found in common FM radios. (The main difference: a radar  
>>>>>discriminator must use DC coupling, as the value appears as a  
>>>>>generally DC signal, although artifacts are possible if the  
>>>>>waves hit the tires, AFAICT.)  
>>>>>  
>>>>>Second-order effects because of relativity appear to be on the  
>>>>>order of 240.5 microhertz -- that's more than an hour in duration.  
>>>>>  
>>>>>A more sophisticated unit might be attuned to the cruiser's speedometer.  
>>>>>Here's where relativity rears its little head -- and it's very  
>>>>>little, as the error in assuming Newtonian physics is on the  
>>>>>order of  $10^{-14}$ ; don't expect to get one's ticket dismissed  
>>>>>that way! The most straightforward computation is  $v_t = v_m + v_c$ ,  
>>>>>where  $v_t$  is the speed of the guy about to be waved over,  
>>>>> $v_m$  is the measured speed of the car, relative to the cruiser,  
>>>>>and  $v_c$  is the cruiser's speedometer indication, which (presumably)  
>>>>>is the cruiser's speed relative to the roadway.  
>>>>>  
>>>>>The correct (if slightly pointless) SR computation would of  
>>>>>course be  $v_t = (v_m + v_c) / (1 + v_m * v_c / c^2)$ .  
>>>>>  
>>>>>I'd worry more about tire wear. :-) Presumably, that  
>>>>>introduces an error of about  $10^{-4}$ .  
>>>>>  
>>>>>

- > *Radar speed cameras certainly do not have to include any*
- > *relativistic effects even if such existed...which they don't.*

Not at a useful level, certainly.

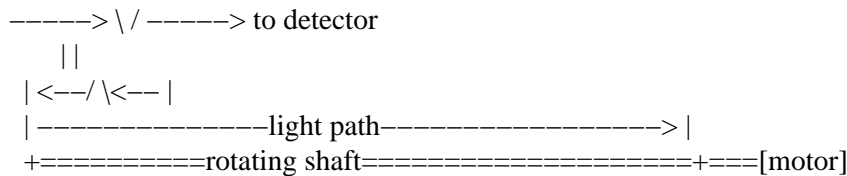
- >
- >>
- >>*Now, as far as lightspeed is concerned -- Fizeau's wheel is*
- >>*probably the most illustrative. Basically, a beam is led*
- >>*through a toothed wheel, in such a fashion that the teeth*
- >>*alternately block it, and let it pass. The chopped beam*
- >>*then feeds through a mirror system to induce a delay, and*
- >>*then back through the wheel in the same path as it took*
- >>*going out. Done correctly, the spinning of the wheel can*
- >>*be used to totally block the beam, and the lightspeed can*
- >>*be computed from the known lightpath, the number of teeth*
- >>*on the wheel, and the rotational speed of the wheel.*
- >
- > *Fizeau's method epitomizes a TWLS measurement.*
- > *The fact that TWLS appears to be dead constant is string*
- > *evidence in support of the ballistic theory.*

This is true, if I understand your ballistic theory correctly. Certainly both MMX and CSSDTWLS [\*] are consistent with a frictionless rigid aether with source invariance. (They're also consistent with SR and GR, of course.)

One way to modify Fizeau's experiment is to use a very long rod with two matched gears at either end, passing the light beam through them (sans mirrors if possible). The main problem here is twisting of the rod as it comes up to speed.

A 100m rod would result in a lightpath of 33 ns. Unfortunately, that's longer than an American football field... :-) A system moving towards us at 30 km/s would introduce a speed variance of  $10^{-4}$ , or a delta of 1 RPM if the gears are spinning at 10,000 RPM, or 166.7 RPS.

It would require about  $0.5 / (166.6 * 33 * 10^{-9}) = 91,000$  teeth on each gear. Fewer teeth would be needed were it to spin more quickly, but the more quickly it spins the more problems one has with dynamic stability. An alternative might utilize a pair of radial diffraction gratings, which might be easier to manufacture; the light would be bounced onto the gratings thusly, through 4 mirrors and the gratings:



||  
||  
grating grating  
disk disk

The entire experiment would have to be carried out in a hard vacuum, all 100m of it. Frictionless bearings would support the rod along its length.

I'm not sure how sensitive the detector would have to be, and the mirrors introduce a momentum component into the lightfeed that may well neutralize the measurement.

>  
>>  
>>*It is not clear to me whether lightsources other than a stationary laser (or maybe just a strong arc-lamp) have been attempted or not, but the result, according to SR, is the same speed: 299792458 m/s. One interesting measurement might be using the light of Venus through Fizeau's apparatus, during the times when Venus is in its first or third quarter phases. However, Fizeau's apparatus may not be quite precise enough, as the delta is on the order of  $5 * 10^{-5} c$  or thereabouts.*  
>  
> *I have suggested an experiment of this nature using red and blue shifted light from stars. The light would have to be sent through an optical gate on the moon.*

The moon introduces a motion of 1.022 km/s (its orbital speed). Tracking the slicer is possible but I'm not sure we can guarantee that it will stay with a desired light source without some work. There are also minor issues with the moon's libration; were one to put a chopper exactly on the edge, it may well prove invisible for part of the lunar month, and useless for another part (as the Moon gets in the way) unless it's tall enough.

> *Even then, it would be hard to detect differences between  $c$  and  $c+v$ .*

Not all that hard if one, say, uses a supernova. :-)

>  
>>  
>>*The actual delta, if SR predictions are correct, is of course 0.*  
>  
> *haha!*

It's what happened to MMX.

>  
>>

Re: Why is the speed of light as it is

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>>[.sigsnip]

>

>

> *HW.*

>

> [www.users.bigpond.com/hewn/index.htm](http://www.users.bigpond.com/hewn/index.htm)

[\*] constant stationary source and destination two-way light speed.

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It's still legal to go .sigless.