Re: Understanding SR − simultaneity

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- *Date*: Wed, 31 May 2006 16:53:48 GMT

"Nicolaaas Vroom" <nicolaas.vroom@xxxxxxxxxx> wrote in message
news:JTifg.457519$cz.12152965@xxxxxxxxxxxxxxxxxxxxxxxx

> "Dirk Van de moortel" <dirkvandemoortel@xxxxxxxxxxxxxxxxxxxxxxxxxxx>
> schreef in bericht news:6mWeg.455490$Ti3.11978818@xxxxxxxxxxxxxxxxxxxxxxx
>
>> The diagram is for you to express yourself properly, and for
>> us to understand you properly.
>
> Correct.
> The Question is does it corresponds with the physical reality.
>
>> That is my problem.
>> When I perform experiment 3 for any speed
>> does the observer R see the signal and front simultaneous ?
>
>> Depends on what you want. Your drawing says he does.
>> That implies that the train's proper length is equal to the
>> distance between L and R multiplied by gamma.
>
> Correct.
> That implies that you have to define in advance for which speed v
> you want to perform this test because you have to correct the proper
> length at v= 0 in order to compensate for length contraction
> when v not equal to 0.
>
>> Is that person the same as
>> when
>> "I" would perform
>> experiment 2,
>> being Observer R and

> > measure no difference ?
> > I expect "your" answer is
> > Yes.
> > But how would you
> > convince "me".
>
> I made the same mistake twice. Sorry.
> This should have been experiment 3.
>
> The correct text is:
>
> Is that person the same as when "I" would perform
> experiment 3,
> being Observer R and measure no difference ?
> I expect "your" answer is Yes.
> But how would you convince "me".
>
> Again, I have no idea what you mean. I don't understand that
> question.

> My problem is that when you perform this experiment
> and when you take length contraction into account
> should Observer R actual measure no difference.
> Accordingly to SR there should be no difference.
>
> The problem is you cannot perform an actual experiment
> to demonstrate this because of the dimensions involved.
> That means I'am not convinced that SR is correct.

We also can't perform an actual experiment where we verify
the velocity composition when someone fires a bullet from a
moving car.
We never performed an experiment where we dropped you
from a building. I don't think that means that you are not
convinced that you will fall to ground.
If you want to learn about experimental verification of
special relativity, have a look at
http://math.ucr.edu/home/baez/physics/Relativity/SR/experiments.html
If that is not enough for you, then ...

> My problem is what is the correct reasoning to convince me
> that SR is correct to describe the outcome of experiment 3.
> Is it something described in this document:
> http://farside.ph.utexas.edu/teaching/em/lectures/lectures.html
> http://farside.ph.utexas.edu/teaching/em/lectures/node114.html

> In the following document is written:
> http://users.pandora.be/nicvroom/simultaneity.jpg
> "From the configuration it is clear that A will judge that the two events occur simultaneously"
> Unfortunately for me it is not clear that when the events occur simultaneous that A will see the flashes simultaneous.

If the events are simultaneous in the frame of A and A is halfway between the flashes, then the flashes are simultaneous *according to A*, and then A will see the flashes simultaneously because we assume that light speed is the same in both directions.

> Accordingly to the drawing it does but IMO that is no reason to accept that it actual does.

There is a reason why we assume that light speed is independent of direction.

> Of course when A sees them simultaneous than B will not see them simultaneous.
> That is simple.
> But the reverse is also possible.
> That is my problem, or is it lack of understanding ?

I think you missed something very basic somewhere, but I still don't know what. If you try to make the single spacetime diagram, we might find out...

> > Since the remainder of what you write after this is just a repeat of what you wrote before, I will snip, but my comments stand.
> >
> > Most important:
> > Draw everything on one single spacetime diagram.
> > Mark the two pairs of signals with different colors.
> >
> > By the way, do you realize that for the train observer (for instance at B, but also at the moving mirror places a and b) the events where the signals hit the mirrors are simultaneous? I.o.w. you can draw a line between the place where you marked t1 on mirror a, and t4 on mirror b. This line is parallel to the x'−axis of the train. You can also look at the a−line (or the B−line, or the b−line, or

> any other line parallel with it) as the t'−axis. It helps when you explicitly draw these lines.

I fully agree with you, but currently this not under discussion..

But this is:
Draw everything on one single spacetime diagram.
Mark the two pairs of signals with different colors.
....

Dirk Vdm

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