Re: Basics series proposed

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From: Paul Draper (*pdraper_at_yahoo.com*)
Date: 10/25/04

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"Androcles" <dummy@dummy.net> wrote in message
news:<jDSed.148683$BI5.112628@fe2.news.blueyonder.co.uk>...

[snip, purely for Google−imposed length restrictions]

> : > : > Assumption:
> : > : > The meaning of simple mathematical terms is understood between
> us
> and
> : > : > used generally. Examples: the X−axis is orthogonal the
> Y−axis.
> 'v'
> : > : > represents
> : > : > velocity. 'c' represents the speed of light and the positive
> velocity
> : > : > of light.
> : > :
> : > : Let's also assume the synchronization procedure as proposed by
> AE
> : > : (though others could be chosen).
> : >
> : > Not agreed.
> : > If you want to specify a procedure then follow your own ground
> rules
> : > which I have accepted. "We'll go things one little step at a
> time."
> :
> : Well, we have to agree on SOME synchronization procedure, because
> it's
> : essential to AE's presentation. I was simply arguing that we adopt
> his
> : because there's nothing wrong with it, and it serves the purpose.
>
> Whoa. This is a sidetrack, but a clock consists of an oscillator and a
> counter. The counter can be remote from the oscillator. I can
> synchonize two counters to the same reading. I am discussing
> Einstein's method,

> not adopting it.
>
>
> : The
> : key thing the synch procedure provides is the equation that comes
> from
> : the bounce of light from A to B back to A: (1/2)[t'(A) + t(A)] =
> t(B),
> : regardless of the frame the synch procedure is done in (provided
> that
> : it's done on clocks in that frame). That equation is used later in
> the
> : derivation, so if it's not accepted, we should start over.
>
> It is one of the bases of discussion. That is not the same as
> acceptance.
> "In agreement with experience we further assume the quantity
> 2AB/(t'A−tA) = c to be a universal constant− the velocity of light in
> empty space." − Einstein.
> Note that the '2' here is later used in the form '½' in the equation
> ½(tau0 +tau2) = tau1, but this ONLY applies when A and B are
> relatively at rest.

Agreed. The synchronization procedure that Einstein proposes only works if A and B are at rest with respect to each other. Moreover, this only works if the clocks are at rest with respect to the frame in which the synchronization is done. This is a key point. Einstein assumes nothing more than this.

> If there is any motion between A and B, then the distance AB differs
> from BA. 2AB does not apply.
> I do not agree on the legitimacy of '½'.
> I do not accept (0.33 + 0.67) / 2 = 0.33, and never will, even if you
> include the coordinates A and B and a function tau(), so that
> ½[tau(A,t0) + tau(A,t2)] = tau(B,t1)
> unless, of course, v = 0.
> I might consider:
*> tau (½) * [tau(A,t0) + tau(A,t2)] = tau(B,t1)*
> but that is not Einstein's math.

Since the above extract is irrelevant to the paper, I'm not responding to it.

>
> :
> : >
> : > :
> : > : > The alternative is to give a predefined list of definitions,
> but
> in
> : > : > this case we

> : > : > would have to predefine
> : > : > V = c+v
> : > : > and
> : > : > V = (c+v)/ (1 + v/c)
> : > : > which are contradictory; they will will be part of the
> discussion,
> and
> : > : > therefore cannot be predefined.
> : > : >
> : > : > Here goes.
> : > : >
> : > : > Fact 1:
> : > : > Einstein derived the so−called Lorentz equations in his paper
> : > : > "On the Electrodynamics of Moving Bodies", (translated from
> : > : > the German here, but the equations transcend language
> difficulties).
> : > : > **
> : > : > (Indicate agreement after each double asterisk following a
> fact,
> or
> : > : > explain the sticking point.)
> : > : >
> : > : > Non−obligatory advice:
> : > : > See http://www.fourmilab.ch/etexts/einstein/specrel/www/
> : > :
> : > : Thanks, that will keep it handy.
> : > :
> : > : >
> : > : >
> : > : > Fact 2:
> : > : > The equations he uses are
> : > : > x' = x−vt {1}
> : > : > **
> : > :
> : > : Agreed. This is a variable he uses. Let's stop here for clarity.
> This
> : > : is merely to establish that a point that is stationary in the
> frame
> k
> : > : will have coordinates in the frame K that are functions of x',
> y, z
> : > : and NOT t. Correct?
> : > : **
> : > Yes. a symbol that is primed belongs to k and corresponds to the
> : > same symbol in K without the prime.
> :
> : No, this is not what Einstein says.
>
> He says a lot of things that are nonsense. Our job is to sift the
> wheat from the chaff.

I would strongly advise against this strategy, and I don't agree with it. We need to take everything as Einstein proposes them, follow them to their logical conclusions, unless we see an error in something that he has said. We should not reinterpret and say, "Einstein should not have said what he said here. What he meant to say was..." That introduces the biases and assumptions of the reader, and has the potential for introducing false inconsistencies.

>
> He's very careful about this. The
> : event coordinates in the k frame are xi, eta, zeta, tau.
> Yes.

Agreed then.

>
>
> : The
> : coordinates in the K frame are x, y, z, and t.
> Right on.
>

Agreed then.

>
>
> : He's making no claims
> : whatsoever that x' represents the event coordinates in EITHER the k
> : frame or the K frame.
>
> I can't agree. He defines x' = x −vt.
> You've just said the coordinates of the K frame are x,y,z,t.
> Therefore x' is moving relatively to x if v is non−zero,
> and it is moving at v, which is what the k−frame is doing
> relatively to the K−frame, and therefore is fixed in the k−frame.

Yes, but just because it is fixed in the k frame does not mean that it is also equal to the value of xi in the k frame. For example, it is POSSIBLE (we haven't got there yet) that xi could have the form xi = c*x', where c is a mathematical constant yet to be determined. In this case xi of a stationary point in k would also be constant but would clearly not be equal to x'. There is NOTHING in what's written in the paper so far that rules that possibility out, so we should allow it as a possible form for xi.

Nowhere in the paper does Einstein say that xi = x'. In fact, later down he says xi = beta*(x−v*t) (or that is to say, xi = beta*x'). Therefore, you're assumption that xi = x' will patently lead to an internal inconsistency within the span of a single section of the paper. It's unlikely that Einstein would intend what you're presuming he's meaning, and then counterdict it later in the paper. It's much

more likely that you're presuming something that Einstein does not, and that the inconsistency is not internal but simply between your presumption and his conclusion. Can you at least yield the provisional interpretation that x' is not xi and see where it leads?

> It certainly does represent an event coordinate, the ray reflects
> at x' at time tau1.

This is not inconsistent with the "change of variable" reading as I've given it. Einstein does mix frame references in a single sentence, but this doesn't mean that x' is to be taken as the COORDINATE in the k frame.

> Sorry to have to say this, but your argument is a simple denial
> and will not be entertained.

I take a softer view. I would presume that if my interpretation of a paper yielded an internal inconsistency within the paper, then I should re−read the paper and re−examine my interpretation.

>
>
> : To do so would be leaping to conclusions. In
> : fact, what he's trying to do is to determine what the functional
> forms
> : of xi(x,y,z,t), eta(x,y,z,t), zeta(x,y,z,t), and tau(x,y,z,t) are,
> : without making any prejudicial assumptions at all.
>
> In fact, he is not succeeding.
> In fact, he fails miserably.
> In fact, I will not accept rhetoric that claims 'fact' as a
> persuasion of what Einstein is trying to do.
> The facts speak for themselves.

But I thought that's what we had agreed to do! We'd take it a step at a time, focus on points where there is a disagreement, and then allow each to persuade the other! Now you're not interested in conceding any persuasion? Nor are you interested in persuading me that I am in error?

>
> :
> : So what's this x' thing? It's not an event coordinate in either
> frame.
>
> The ray reflects at (x', eta, zeta, tau1) in the k−frame.

That's not quite what he said. He said the following:
"From the origin of system k let a ray be emitted at the time (tau0) along the X−axis to x', and at the time (tau1) be reflected thence to the origin of the co−ordinates, arriving there at the time (tau2);"

He is clearly mixing terms between the two frames (for example, referring to the X−axis rather than the Xi−axis), but I don't see anywhere where he assigns k−frame coordinates (x', eta, zeta, tau1), as a collection, to this event.

> That reflection is an event.
> I will not accept simple denial of this as a mathematical proof.
> The variables are xi, eta,zeta, tau in k.
> x' is a coordinate, not a variable.
> You are incorrect.

This interpretation would of course lead to an immediate internal inconsistency in the paper with his later statement that xi = beta*(x−v*t). Rather than adopting an interpretation that makes the paper worthless, I'm considering an interpretation that is not obviously ruled out, and which admits internal inconsistency. Is there a reason why you won't do this?

>
>
> : It is simply a change in variable,
>
> It is not a variable, it is a coordinate.
> You are incorrect.
>
> : like what you would use in calculus
>
> grammar?
>
>
> : to make solving an integral easier, even if the new variable has no
> : physical meaning in the problem. Why is he doing it?
>
> So that he can make a vital prime vanish and pull the wool over
> your eyes, agree with Lorentz and make a name for himself.
> You can fool all the people some of the time,
> All of the people some of the time,
> But you cannot fool all of the people all of the time.
> Einstein was a huckster. Many criminals are extremely intelligent,
> and Einstein was a criminal.
> Well, you did ask.
> It has no relevance to the discussion, though, and neither
> does your attempt at explaining dummy variables.

Well, I usually try to give articles the benefit of the doubt until I run into an obvious error, without resorting to libelous claims about the author. Note that the paper appeared in a peer−reviewed journal, which meant that it had to pass the inspection of careful readers. Note too that this paper appeared the same year as Einstein's useful but not spectacular PhD thesis, so it's not likely that readerss were swayed by his reputation −− he had none. The readers were apparently

able to accept the change−in−variable interpretation as reasonable and consistent. This seems to be your sticking point.

>
> : It will make a
> : later step easier. All that is true of x' is the following: A point
> : that is stationary in the frame k will not have a constant value of
> x
> : in the frame K, but x' (as defined in the K frame, not the k frame)
> : WILL have a constant value. That is, while the x value of that point
> : will have time dependence that we would have to worry about in a
> later
> : derivative, the x' value of that point will not.
> :
> : Einstein is NOT saying that x' is the value of the coordinate in the
> k
> : frame.
> Yes he is. That is the name of the point where the ray reflects.
> You are incorrect.

Yes, and that point is seen in both the K and k frames. Therefore it has an x value and a xi value, and as it turns out, a value of x' that we can calculate from x by its definition.

>
> : That would be presuming that xi will end up to be x'. No such
> : presumption is made, nor in fact will that be the conclusion in the
> : end. Nor should we presume it. It's not obvious.
>
> I do not presume it, and it is obvious. The ray reflects at x'.
> Einstein says so.
> "From the origin of system k let a ray be emitted at the time tau0
> along the X−axis to x', and at the time tau1 be reflected thence to
> the origin of the co−ordinates"
> You should not presume x' to be anything else, and I will not accept
> any other definition.
> You are incorrect.

I'm sorry I'm so dense. It is not obvious to me at all. Where does he say that xi for that event is x'?

>
> :
*> : What I *suspect* he is doing*
>
[snip for length and staying on topic...]
>
> I'm here to prosecute Einstein for fraud, before all Google readers to
> see.
> You've chosen to be his defence attorney. Let the record show that so
> far you've denied x' is a place where an event occurs and are now

> showing uncertainty of Einstein's intentions, my learned friend. I'm
> not prosecuting you, please understand, but your client.

I've denied that x' is the value of the xi coordinate in the k frame,
that's all. I've not denied that the event has certain value of x',
only that it is not the same as xi. You seem extremely focused on this
one sentence.

>
>
> : (we'll found out in a bit) is that he is
> : using the change in variable to do the derivation in two steps. He's
> : going to find out the form of, for example, tau(x',y,z,t) and then
> : undo the variable change to find out the form of tau(x,y,z,t). The
> use
> : of x' is just a mathematical trick to make the derivation easier,
> even
> : though it does it in two steps.
> :
> : So let's let Einstein use this change of variable from x to x' in
> the
> : K frame and see where he goes with it. Let's not assume anything or
> : read meanings in that aren't there yet.
> :
> : Agreed?
>
> No, not agreed.
> x' moves at velocity v relative to the K−frame, because x' = x−vt.
> Chose any x in K, and x' is displaced from x by a distance vt.
> That includes x = 0.

That is certainly true. x' does move to the right at velocity v
relative to the K frame. That does not automatically make it the xi
coordinate for the k frame, which also moves to the right with
velocity v. As I indicated above, it is POSSIBLE (we've yet to see)
that xi could be xi = c*x', where c is a number or a function
independent of x, yet to be determined.

(In fact, to presume that xi MUST be the same as x' is tantamount to
insisting that space and time respect Galilean transforms rather than
any other possible transform. It's no wonder that insisting on a
Galilean transform yields an inconsistency with a Lorentz transform.)

>
> The judge wants to adjourn for lunch, and so do I. Take time out
> to regroup, your argument needs some polish. :−)
>

Well, that's a pity because there is much useful discussion on the
SAME topic below that I would have liked to see you respond to.

PD

>
>
>
> : **
> :
> : > Diagramically, we have
> : > O'−−−−−−−−−−−−−xi−−−−−x'
> : > O−−−−−−−−−−−−−−−−−−−−−x
> : > where ' is to be the origin of k, aka (0,0,0,tau) and
> : > o is the origin of K, (0,0,0,t).
> : > We have to establish the relationship between xi and x, tau and t,
> : > eta and y, zeta and z.
> : > I think you will stipulate to eta = y, zeta = z.
> : > I have drawn xi < x' to represent length contraction of the moving
> k
> : > frame.
> : > Recall that Einstein claims
> : > xi = (x−vt) * gamm = x' * beta, where beta = 1/sqrt(1−v^2/c^2)
> : > Note that I have carefully primed O', the origin of the moving
> frame
> : > to distinguish it from O, the origin of the stationary frame.
> : > I shall prove that xi = x' = x, v = 0.
> :
> : Moving too far ahead. Let's back up (see above) and take it a step
> at
> : a time.
> :
> : >
> : > : >
> : > : > and
> : > : > ½[tau(0,0,0,t)+tau(0,0,0,t+x'/(c−v)+x'/(c+v))] =
> : > : > tau(x',0,0,t+x'/(c−v)) {2}
> : > : > **
> : > :
> : > : Correct. This statement follows the synchronization procedure
> that
> AE
> : > : proposed, asserting that in the frame k, the time tau to go from
> the
> : > : origin of the K frame (call it O') to x' must be the same as the
> time
> : > : tau to go from x' back to O'. Agreed on the meaning?
> : > : **
> : > No. the origin of the K−frame is O, not O'
> :
> : You may be right. I may have mistyped. But you know what? Let's not
> : use O and O' anyway. They're not in the paper, and we don't need
> them.
> : Let's drop them from further discussion. OK?

> : **
> :
> : >
> : >
> : > : >
> : > : > Fact 3:
> : > : > The basis of {2} is
> : > : > t0 = t
> : > : > t1 = t0+x'/(c−v)
> : > : > t2 = t1 + x'/|(c+v)
> : > : > **
> : > :
> : > : Sorta. That's PART of the basis. The other part of the basis is
> that
> : > : (1/2)[tau0 + tau2] = tau1, as I mentioned above. The
> substitutions
> for
> : > : t0, t1, and t2, are just as you say.
> : >
> : > Of course. I simply wanted to abbreviate.
> :
> : OK, note that this stems directly from the synchronization procedure
> : that I asked that we presume. See above.
> :
> : >
> : >
> : > : >
> : > : > Fact 4:
> : > : > The spatial coordinates that correspond to the times are
> (0,0,0),
> : > : > (0,0,0)
> : > : > and (x',0,0); This yields events (0,0,0,t0), (0,0,0,t2) and
> : > : > (x',0,0,t1) and
> : > : > these events are the argument to the function tau().
> : > : > **
> : > :
> : > : OK, here is where I'm not clear what you mean by spatial
> : > coordinates.
> : >
> : > (x,y,z) are spatial coordinates. (t) represents time.
> : > "If we place x'=x−vt, it is clear that a point at rest in the
> system k
> : > must
> : > have a system of values x', y, z, independent of time."−
> Einstein.
> :
> : Note that he is NOT saying that these are the values of the
> : coordinates in k. I read this to mean:
> : Take a point that is rest in k. Then while x (a coordinate of that
> : point as measured in K) has a value that is dependent on time,
> instead

> : x' (a change of variable of the position of that point as measured
> in
> : K) has a value that is independent of time. Thus, x', y, z are
> : suitable coordinates of that point, as measured in K, that are
> : independent of time.
> :
> : Agreed?
> : **
> :
> : > In system k, this would be better expressed as (x', eta, zeta) to
> : > avoid
> : > confusion.
> :
> : Disagree. This is leaping to a conclusion that we can't make. We're
> : trying to find the functional dependence of xi on x, y, z, t. We're
> : NOT to presume that we already know that xi = x' = x − vt. That
> would
> : be premature. Agree to hold off on this presumption?
> : **
> :
> : > Recall that k is the 'greek' frame, Kappa is the 'roman'
> : > frame :−)
> : > Before you dispute this, read on, because I anticipate this may be
> : > a sticking point that I have tried to clarify below, where you
> have a
> : > line that needs staring at.
> : > **
> : >
> : > Incidentally, (t) is not a vector. There is no going back to when
> you
> : > were.
> :
> : I don't think we have to imply anything about the nature of the
> : assembly of coordinates as a vector yet. We are simply defining four
> : values to associate with an event: x, y, z, and t as measured in the
> K
> : frame, and xi, eta, zeta, tau as measured in the k frame. Take them
> to
> : be independent scalar values, if you like. And all we are saying is
> : that xi can be written as a function of x, y, z, and t, and so on.
> No
> : assumption about the conglomerates [x,y,z,t] or [xi,eta,zeta,tau]
> need
> : to be taken at this point.
> :
> : > That's just another way of saying time has no additive inverse.
> : > Exploring "If it did" belongs to the realm of sci−fi, the
> grandfather
> : > paradox looms ugly, and while bed−time reading fun it has no place
> in
> : > physics, which is the topic of our discussion. With that, I

> dismiss
> : > Minkowski as irrelevant.
> : > **
> :
> : Again, leaping too far ahead. Let's take it a step at a time.
> :
> : >
> : >
> : > : Are you saying these are the coordinates (x,y,z) as measured in
> the
> K
> : > : frame?
> : >
> : > The coordinates (x',y,z) belong to the k−frame, and y = eta, z =
> zeta.
> : > Coordinates cannot be measured, they simply ARE. We can only
> compare
> : > (i,e. make measurement) between frames.
> : > **
> :
> : Disagree. See the above. Presuming too much, too fast. x' is simply
> a
> : change of variable in the K frame, not asserting part of the answer
> : for the k frame.
> :
> : >
> : >
> : > : If that's what you're saying, then I disagree. Einstein was
> : > : postulating tau to be a function not of x, y, z, and t, but of
> x',
> y,
> : > : z, and t.
> : >
> : > x' does not belong to the K frame. We've only two frames, and
> : > x' = x−vt.
> : > x' is moving, being constantly displaced from x by a distance vt.
> : > x' belongs to the k−frame.
> : > Perhaps your thinking is represented by this diagram:
> : >
> : > O'−−−−−−−−−−−−−−−xi−−−
> : > O−−−−−−−−−−−−−−−x'−−−x
> : > or this;
> : > −−−−−O'−−−−−−−−−−−−−−−xi
> : > O−−−−−−−−−−−−−−−x−−−x'
> : >
> : > I will not consider a third frame.
> : > We have point of contention, so maybe we should break here to
> clear it
> : > up.
> : > However, I'll try to right now by answering your next point.
> :

> : I'm not thinking of a third frame. x' is not a coordinate in either
> : frame, nor does it have to be a coordinate in any frame. It is a
> : change of variable used as a mathematical device, without much
> : physical content except that its value for a point stationary in the
> k
> : frame is constant, independent of time.
> :
> : >
> : >
> : > : I quote from the paper: "We first define (tau) as a function of
> x',
> y,
> : > : z, and t."
> : > : Thus, for example, the ray proceeds from
> : > : (x',y,z,t) = (0,0,0,t)
> : > : to
> : > : (x',y,z,t) = (x',y,z,t1) [yes, this line takes some staring
> at]
> : > : and back to
> : > : (x',y,z,t) = (0,0,0,t2)
> : > :
> : > : Are we in agreement?
> : > : **
> : > You are using x' as a variable.
> :
> : Exactly. This is precisely what Einstein has in mind.
> : Agreed?
> : **
> :
> : > It is supposed to be a coordinate
> : > and therefore fixed relative to the origin.
> :
> : Disagree. It's not a coordinate per se. The thing that is fixed with
> : respect to the origin of the k frame is the light source and the
> : mirror that is used for synchronization. The value of x' of the
> light
> : source and the value of x' of the mirror, as seen in the K frame,
> are
> : constant values, independent of time. But that doesn't mean that x'
> IS
> : the coordinate of anything in either the K or k frames.
> :
> : Let's just allow the change in variable without assigning any
> : coordinate interpretation for the time being. OK?
> : **
> :
> : >That is why it is
> : > difficult
> : > to comprehend the line that needs staring at. You'll need to use
> : > a different symbol, perhaps 'm' for mirror, and then you'll have
> : > (x',y,z,t) = (0,0,0,t0)

> : > (x',y,z,t) = (m,y,z,t1)
> : > (x',y,z,t) = (0,0,0,t2)
> :
> : This is right, as seen in the K frame.
> :
> : >
> : > This is then identical to
> : >
> : > (x,y,z,t) = (0,0,0,t0)
> : > (x,y,z,t) = (m,y,z,t1)
> : > (x,y,z,t) = (0,0,0,t2)
> :
> : This is not right, as seen in the K frame. In the K frame, the light
> : source and the mirror are moving to the right all the time. Thus the
> : light source generally has the values, for example:
> : (x,y,z,t) = (0+vt, y, z, t)
> : If we say that at time t0, the light source is at x=0 and the mirror
> : is at x=m, the three events then have the values
> : (x,y,z,t) = (0+v*t0, 0, 0, t0) Light emitted from source
> : (x,y,z,t) = (m+v*t1, 0, 0, t1) Light bouces from mirror −− note
> : mirror has slid to right
> : (x,y,z,t) = (0+v*t2, 0, 0, t2) Light returns to source −− note
> : source has slid to right
> :
> : Since these coordinates depend on time, which will possibly cause
> : trouble later when doing some calculus, let's do a variable change
> : from x to x'=x−vt, which yields for the three events, as seen the K
> : frame but in changed variables
> : (x',y,z,t) = (0,0,0,t0)
> : (x',y,z,t) = (m,0,0,t1)
> : (x',y,z,t) = (0,0,0,t2)
> :
> : > which yields the same result, x' = x and x' = x−vt, hence v = 0.
> : > You could then argue that we should use m', but there is to be
> : > but one mirror. Decide if it moves.
> :
> : No, incorrect conclusion, but again it's leaping too far ahead. Take
> : little steps.
> :
> : >
> : > : >
> : > : > Fact 5:
> : > : > The arguments to the function tau() belong to the "stationary"
> K−frame
> : > : > which is the domain of the function. The codomain (or image as
> it
> is
> : > : > often
> : > : > referred to in the USA) is the "moving" k−frame.
> : > : > **
> : > :

> : > : Sorta. The arguments are not the coordinates (x,y,z,t) of the K
> frame,
> : > : but a related set of coordinates (x', y, z, t).
> : > : Agreed?
> : > : **
> : > No. There is no third frame. Now I'll stop.
> : > Androcles.
> :
> : A change in variables does not force the x' variable to represent a
> : coordinate in any frame. I'm not presuming a third frame, only a
> : change in variables.
> :
> : >
> : >
> : > :
> : > : >
> : > : > Fact 6: (a quotation)
> : > : > "From the origin of system k let a ray be emitted at the time
> tau0
> : > : > along the X−axis to x', and at the time tau1 be reflected
> thence
> to
> : > : > the origin of the co−ordinates, arriving there at the time
> tau2;"
> : > : > **
> : > :
> : > : Agreed, indicating the synchronization procedure to be followed
> in
> any
> : > : frame.
> : > :
> : > : >
> : > : > Fact 7:
> : > : > The light has returned to the origin of K. If k is indeed
> moving
> : > : > relative to K, the tip of the ray has gone past the origin of
> k,
> now
> : > : > displaced from the origin K by a distance v(t2−t0).
> : > : > **
> : > :
> : > : No. This is NOT what Einstein said. It returns to the origin of
> k,
> not
> : > : the origin of K. This follows mathematically from the fact that
> tau
> is
> : > : a function of x', y, z, and t, not of x, y, z, and t. But let's
> see
> : > : why he does it this way.
> : > :

> : > : Read again the synchronization procedure. Einstein proposes a
> point
> A
> : > : and B in a frame, but let's make it concrete. Let's suppose at A
> is
> a
> : > : light source (a camera flash) and a photodiode, and at B is a
> mirror.
> : > : There is a clock at both locations. It's important that the
> equipment
> : > : at both ends be stationary in the frame where the
> synchronization
> : > : procedure is done −− that's how he defined it. Thus the
> procedure is
> : > : to fire the flash, bounce the light off the mirror, and receive
> it
> : > : back at the location of the source. If the time elapsed in both
> : > : directions is the same, then the clocks in that frame are
> : > : synchronized. This is the basis of the second line of your Fact
> 2.
> : > : Because this is done to synchronize the clocks in k, this
> equipment
> : > : must be at rest in the frame k, meaning of course that they are
> : > : traveling to the right with speed v in frame K. Thus, if the
> flash
> is
> : > : at the origin of k when it is fired, the return pulse is again
> : > : received at the origin of k. This corresponds to x' = 0, but not
> x=0,
> : > : in the frame K.
> : > :
> : > : Acknowledge the error?
*> : > : **
> : > :