

Re: Simple four velocity question

Source: <http://sci.tech-archive.net/Archive/sci.physics.relativity/2009-03/msg01157.html>

- *From:* Jonathan Doolin <good4usoul@xxxxxxxx>
 - *Date:* Sat, 14 Mar 2009 06:38:40 -0700 (PDT)
-

On Mar 14, 1:28 am, "Androcles" <Headmas...@xxxxxxxxxxxxxxxx> wrote:

"Jonathan Doolin" <good4us...@xxxxxxxx> wrote in message

<news:bf6f4bd6-4d61-43ab-aec5-aa57c5d6952a@xx>

On Mar 13, 12:59 pm, "Ken S. Tucker" <dynam...@xxxxxxxx> wrote:

On Mar 12, 4:18 pm, Jonathan Doolin <good4us...@xxxxxxxx> wrote:

On Mar 11, 9:20 pm, "Ken S. Tucker"
<dynam...@xxxxxxxx> wrote:

On Mar 11, 4:26 pm, "Ken S. Tucker"
<dynam...@xxxxxxxx> wrote:

On Mar 11, 7:27 am,
Jonathan Doolin
<good4us...@xxxxxxxx>
wrote:

On Mar 10,
9:48 am,
Tom
Roberts
<tjroberts...@xxxxxxxx>
wrote:

Jonathan
Doolin
wrote:

Re: Simple four velocity question

Does
it
seem
awkward
to
anybody
else
to
take
the
the
derivative
of
the
"four-position"
with
respect
to
tau
instead
of
with
respect
to
t?

No.
This
is
the
general
geometric
way
to
form
the
tangent
vector
to
a
path
(where
tau
is
an
affine
parameter
of
the

Re: Simple four velocity question

path).

This
pretty
much
assures
that
for
all
objects,
you'll
get
the
same
first
coordinate
 $(c \cdot \gamma \cdot t) / d(\tau)$
=
 $d(c \cdot \tau) / d(\tau)$
=
c,

Not
true.
It
is
the
norm
of
4-velocity
that
is
c,
not
the
"first
coordinate"
(by
which
I
assume
you
mean
the
time
component).

Re: Simple four velocity question

For
an
object
moving
with
speed
 v
along
the
 x
axis
of
the
inertial
frame
used
for
the
components
of
4-velocity,
those
components
are
 $(c\gamma, \gamma v, 0, 0)$,
 $\gamma = 1/\sqrt{1 - v^2/c^2}$.

and
as
Mr.
Green
said,
you
don't
have
a
well-defined
four-velocity
for
light.

Yes
(more
on
this

Re: Simple four velocity question

soon...).
But
the
tangent
vector
to
the
path
is
well
defined
for
light,
as
is
the
4-momentum,
and
they
are
equally
useful.

Is
the
wikipedia
article
error?

It
looked
OK
to
me.
But
it
did
not
imply
your
claim
above.

Tom
Roberts

Re: Simple four velocity question

Just to be
sure,
though,
look
carefully
where the
article
states:

=====
"Components
of the
four-velocity"
The
relationship
between the
time t and
the
coordinate
time x_0 is
given by
 $x_0 = c * t =$
 $c * \gamma * \tau$

=====
But you
appear to
have said
 $x_0 = c * \gamma$

Are these definitions
agreeable,

<http://farside.ph.utexas.edu/teaching/jk1/lectures/node15.html>

Ken

IMO, Ken, that link entails an ambiguity as
to
what type of derivative is employed in
Eq.(115),
to justify defining the L.H.S. of (115) as a
tensor. Would you say it's an absolute

Re: Simple four velocity question

derivative?

Apparently this does certainly needs the attention of expert discussion, especially to evaluate Eq.(118).

Ken S. Tucker

So I guess the question is whether it is physically meaningful to take the second derivative with respect to tau? (Eq 115.)

This may or may not be a difficulty, but I see that the first derivative takes into account a reference frame with an origin ($t=0, x=0, y=0, z=0$) in the rest frame.

Another way of looking at the problem is this. In an inertial frame (accelometer reading zero), at a Point P, (origin) is a lab where Physics experiments are being conducted.

In SR, a multitude of references may have a uniform motion (not accelerating) with velocities from $v=0$ to $v<c$, and take measurements of the Physics at P, and all FoR's will agree the Physical Laws are true, at P. The Lorentz Transform also allows for the arbitrary observer to be displaced in space from P.

When an acceleration is applied, the "generalized Lorentz Transform" involves a translation, so the origin will NOT stay in the same place.

I think "shoe-horning" acceleration into LT was tried after SR1905, but found unsatisfactory necessitating the full development of GR1916.

I'm not sure what you mean by "shoe-horning" and I distrust the word "unsatisfactory" when used in relation to General and Special Relativity. If you want something satisfactory, get cake and ice

Re: Simple four velocity question

cream. But a good understanding of the Lorentz Transformations is rather more like car-sickness or vertigo.

I think this would be okay as long as the accelerating particle is at the origin.

Yes, that's about my understanding too. I'm not sure whether it's a physical requirement or a limitation imposed by using tensor analysis. In tensors, the transformation between two CS's is at the same point.

I was speaking of a physical limitation. The Lorentz Transformation

=====
doesn't exist.

SANITY WARNING (Droolin' Doolin)

Scruffy Rat's postulate: "light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body" bears no resemblance whatsoever to Doolin's: "Scruffy Rat's 2nd postulate of S.cruddy R.atshit says that the speed of light is c in every inertial frame."

Scruffy Rat himself says "But the ray moves relatively to the initial point of k , when measured in the stationary system, with the velocity $c-v$, so that $t = x'/(c-v)$."

Doolin makes no apology for misrepresenting Scruffy Rat by echoing the popular prayer, instead he chants the mantra spoken unto him by the insane Bonehead Green. Chanting mantras is like saying prayers, a form of witchcraft known as uttering spells.

Doolin cannot distinguish $c-v$ in the stationary frame from c in the moving frame.

This form of insanity is known professionally among scientists as bigotry and lying. Guilty by reason of insanity is still guilty. The asylum inmates assert that it is the doctors treating them that are lying, even those untrained in psychiatry.

"Physician, heal thyself." – Jesus H. Christ, self-proclaimed son of Gawd, superman and god-on-a-stick, professional holy man and sky pilot, Captain of the starship "Cloud", litterbug of the Holy Grail (now lost) and diner of Last Suppers.

Re: Simple four velocity question

Other characteristics – walked on water, turned water into wine, preferred the male company of twelve rent boys and advocated "love" to them all and their neighbours. Was not popular among the establishment, having upset their banco and causing widespread economic disruption. (Banco is an Italian word for bench from which the English word "Bank" is derived. He upset the money benches or tables outside the temple to Gawd.)

Favourite quote: "Eloi, eloi, lama sabathani."
(Translation: "Oh, fuck it! I screwed up. You were supposed to help but thanks anyway, I will still kiss your arse, Your Hole-iness!")

Doolin wants to play hardball
<http://tinyurl.com/bw55m7>– Hide quoted text –

– Show quoted text –

John Parker is inhabited by a demon called Androcles. I pray for John Parker, that he might be forgiven, so that he could return to his childhood innocence and desire eternal life. I can only say to John Parker, that you must *want* to be healed. Then your own faith can heal you.

John Parker, come out and see the light. I forgive you but I don't believe that God forgives the demons that live inside you. If you cling to Androcles and The Big Bad Wolf, where are they going to take you? I say let go of these dead hopes, and live.

.