

Re: Einstein's Train Gedanken Re-visited

news:e5e3aac9-be6e-48e9-bb6a-2936b6dca28c@xxxxxxxxxxxxxxxx

On
Jun
22,
11:38
pm,
"Dono."
<sa...@xxxxxxxxxxxx>
wrote:

On
Jun
22,
5:33
pm,
Bruce
Richmond
<bsr3...@xxxxxxxxxxxx>
wrote:

The
Hafele-Keating
experiment
was
conducted
in
the
non
inertial
frame
of
the
earth's
surface.
That
is
why
the
two
directions
did
not
give
the

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same
result.

The
HKX
was
conducted
in
the
air,
about
30,000
ft
from
the
earth's
surface.
The
calculations
for
it
were
executed
in
the
frame
of
reference
whose
origin
is
coincident
with
the
center
of
the
Earth.
This
is
the
same
frame
of
reference
as
the
one
used

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by
GPS
calculations
(called
EFI
in
the
GPS).
This
frame
is
as
close
to
an
inertial
frame
as
we
can
get.
The
reason
the
clocks
showed
different
elapsed
times
is
the
same
one
as
the
one
in
the
little
problem
I
challenged
Whoever
to
solve:
the
palnes
with
the
clocks
on

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board
had
different
speeds
wrt
EFI.

But
the
bottom
line
is
that
when
the
clocks
were
brought
back
together
on
the
surface
of
the
earth
their
settings
had
changed.
We're
not
talking
about
"according
to
calculations"
here,
we
are
talking
their
actual
settings
as
measured
in
the
real

world.

I think he
means that
the
calculations
of the
expected
results.
And
the
observed
results
verified that
(within
experimental
error).

I read it that you could
change the results by
choosing a different
frame to do the calculations
in. That's why I pointed out
that the
experiment provided the
actual result.

So .. what
would
happen if
we moved
the clocks
apart at the
same speed
according to
the (almost)
inertial
frame of the
center of the
earth.
So
(for
example)
the one
moving

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with the
earth would
stay 'still'
(relative
to
the earth)
and the
other one
move away
at twice the
speed of
earth's
rotation in
the opposite
direction.

You would still get the
effects.

Are you sure about that ?

Yes.

For starters what you proposed and what you described were
not the
same thing.

Yes .. they are

Your discription still had the clock(s) moving on the
earth's surface.

No .. it clearly didn't. Only one of them.

Ok, I'll grant you that. I misinterpereted what you were saying.

==>> >> So .. what would happen if we moved the clocks apart at the same speed

according to
the (almost)
inertial
frame of the
center of the
earth.
So
(for
example)
the one
moving
with the
earth would
stay 'still'
(relative
to
the earth)
and the
other one
move away
at twice the
speed of
earth's
rotation in
the opposite
direction.

==

See there "the one moving with the earth would stay 'still' (relative to the earth) "

So they are still moving along curved paths in the ECI system.

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Yes they are

Combine that with the fact that even the ECI system is not truly inertial and it becomes very unlikely that the effects will cancel out.

http://en.wikipedia.org/wiki/Earth_Centered_Inertial

"It should be noted that ECI frames are not truly inertial since the Earth itself is accelerating as it travels in its orbit about the Sun."

Grr ... Picky .. so the only affect is due to the movement of the earth around the sun and the sun around galactic core, and whatever non-inertial movement the galaxy may have.

So .. ignoring those effects .. treating the ECI as inertial for the sake of this thought experiment .. (which seemed to be obvious from context, but I see we need to make it explicit) what do you claim about the clocks as described?– Hide quoted text –

– Show quoted text –

I thought the whole purpose of this exercise was to get clocks in sync without using light signals so that a real world experiment could be done to measure one way light speed isotropy.

Yes if you move two side by side synched clocks symmetrically in the opposite directions at the same velocity and stop them simultaneously....these two clocks will remain synchronized according to SR. These two clocks can be used to measure the OWLS directly.

Ken Seto

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So besides the slight non-inertial effects you mentioned above you will also have the problem that the clock will get out of sync due to the acceleration to get it up to speed and deceleration stop it.

You also have the problem that after stopping the transported clock, even if it is in sync, the clocks are not at rest in the ECI system. If you manage to throw a ball to someone on the other side of a merry-go-round while it is spinning its time of flight will be different than if it weren't spinning.

Yes, it's my turn to be picky ;)~-- Hide quoted text --

-- Show quoted text -- Hide quoted text --

-- Show quoted text --