

## Re: The Spin Proviso to Relativity

**Source:** <http://sci.tech-archive.net/Archive/sci.physics.relativity/2004-10/4768.html>

---

**From:** Ben Bean (*kavs\_delethis\_\_at\_sysmatrix.net*)

**Date:** 10/21/04

Date: Thu, 21 Oct 2004 05:53:19 -0400

"Paul B. Andersen" <paul.b.andersen@hia.no> wrote in message  
news:cl6d07\$8jb\$1@dolly.uninett.no...  
>  
> "Ben Bean" <kavs\_delethis\_\_at\_sysmatrix.net> skrev i melding  
news:B8SdncZcW\_z2v-ncRVn-oA@sysmatrix.net...  
>> *I am eager to hear wisdoms in answer to the quandary below stated.*  
>>  
>> *SCENARIO: You stand on a planet just like Earth, but there's no  
atmosphere.*  
>> *You stand on the equator and hold your hands up to the air so that they  
are*  
>> *a meter apart. [Relax, this is NOT a study in relative simultaneity like  
the*  
>> *Barn/Pole thing.] As you stand there a huge spacecraft coasts by just*  
>> *overhead, just beyond your reach. The ship seems motionless to you,*  
>> *hovering, because it is going eastward at a speed to exactly match the*  
>> *planet's tangential rotational speed. As you reach up, your outstretched*  
>> *fingertips are just about touching the 842-meter mark and the 843-meter  
mark*  
>> *on the rule graduated on the enormous ship's straight exterior.*  
>>  
>> *Here's the quandary: the spaceship occupants can EMPHATICALLY assert  
that an*  
>> *all-way light beacon pulse emitted midway between their ship's 842 &  
>> 843-meter marks will hit the two nearby meter marks simultaneously,*  
>> *according to their native frame's clocks and such. Yet the guy on the  
planet*  
>> *cannot make the same claim?? When does an arbitrary local span become*  
>> *tantamount to an SR scenario. In spite of Sagnac, there must surely be  
some*  
>> *carry-over; I mean you're just about TOUCHING that other frame,  
comoving.*  
>>  
>> *-Ben*  
>  
> *Of course the guy on the planet will agree that the light will hit the two  
metre*

- > marks simultaneously. That is, if he had one clock at each side of himself,
- > and he E-synched those clocks, they would show the same when hit
- > by the light.
- > However, if the two clocks were showing UTC, they would NOT
- > show the same when hit by the light.
- > Clocks on the surface of the Earth showing UTC are NOT synchronous
- > in the Earth fixed frame. They are synchronous in the non rotating ECI-frame.
- >
- > Paul
- >
- >

Great answer! Uh, but, whereas I know what ECI stands for, I am at a loss as to what UTC stands for. But I think it matters not. You say that Earth's surface clocks can all be synched to the non-rotating ECI, which suffices. I don't necessarily buy your dismissal of Sagnac (of course I am misinterpreting perhaps), but your answer suggests that a light signal takes the same time to go from NY to LA as the reverse, as long as you use the non-rotating ECI clocks as your basis. I guess that makes sense alright, but it's insufficient. The guy reaching up and touching the inertially moving space ship — he has a wrist watch on each arm and he claims they are synchronized. His clocks belong to a frame that IS rotating. I'm just not sure. Again, what is UTC, Universal Time something?

The central question is, "How does light behave in the frame of the man standing with his arms outstretched (over his head), and ONLY according to that man's native clocks & measures"? Can the man say that a light signal emitted midway between his hands arrives at each hand at precisely the same time? Probably not. But light would clearly not move relative to a theoretical aether fixed at the planet's center either. So there must be some give. Light must take less time to go westward than eastward (on the spinning planet), which would be in line with the Sagnac findings, but not so much less time as would be predicted by imagining the light travelling through some fixed aether frame anchored at the planet's center.

It's confusing alright.