

Re: A little challenge for relativists.

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- *From:* John Kennaugh <JKNG@xx>
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Your posting is full of assertions but you attempt to make no case nor to fault my previous detailed arguments.

Tom Roberts wrote:

John Kennaugh wrote:

I do not reject the Maxwell/Lorentz/Einstein ether theory (commonly referred to as relativity) but I am very reluctant to accept it because it is an ether based theory and I am prejudiced against the concept of the ether.

Then you should actually STUDY relativity, and its history -- your phrasing displays your ignorance: Relativity most definitely is not an "ether theory". And the real theory is GR, not SR, and Maxwell and Lorentz had essentially nothing at all to do with its development

So now Maxwell has nothing at all to do with it. In a previous posting you said:

Einstein was basically assuming that Maxwell's Equations are "laws of physics",

You did not reply to my previous posting so I assumed you accepted my arguments. It appears that is not the case so I put them to you again.

If light is source independent it is because some physical process makes it so. Maxwell's Equations may be consistent with that physical process but light is not source independent because Maxwell's equations say so. You may wish to divorce physical process from the mathematics in order to

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preserve your belief system but I see no evidence that Einstein did.

Maxwell believed he had found equations which represented light travelling in the ether. If you decide there is no ether then you have to decide what, if anything, those equations are describing. Without an ether they can only be describing light leaving the source at c relative to the source. Without an ether they cannot be describing light travelling w.r.t the observer at c - the mathematical alternative. I say that for two reasons:

1/ There is no possible causality which will allow the speed at which the observer travels to influence the speed at which light leaves the source.

2/ The equations must describe light leaving the source in the case where there is no observer.

Since the M.E. imply the speed of light is source INdependent, SR follows.

They also implied that the speed of light would be dependent upon the speed of the observer - that is what the MMX was all about. If you interpret MMX as showing there to be no ether (which is not what either Lorentz or Einstein did) then you have to decide what it is that ME are physically describing before you can use them again. As I point out, without an ether, ME must be describing light leaving the source at c .

The only physical model which will give you source independence is the ether. If the speed of light is not dependent upon the source, either in terms of the physical processes taking place in the source, or simply as a reference point from which a natural progression starts to take place at constant speed - then it must be dependent upon something else and that something else must take charge of it the moment it leaves the source. That 'something else' is called the ether and it has to be physical as it has to take part in a physical process. It requires a physical process which Maxwell's equations may (or may not) model within their sphere of applicability.

If you assume an ether, then you may assume source independence. You then need to explain why the equations prediction of observer dependence are not correct re MMX. IF you assume an ether and with it source independence, then and only then can you interpret MMX as showing that apparently every observer is stationary w.r.t. the ether which is what Lorentz did. If you don't assume an ether then for the reasons I gave above, Maxwell's equations must describe light travelling away from the source at c which would explain the MMX result very simply.

Einstein described Lorentz as providing the greatest contribution to electrical theory since Maxwell. If as you say Einstein saw Maxwell as giving him tablets of stone then Lorentz came second. If symmetry was all

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he was after then all he had to do is get rid of the cause of the asymmetry - the ether. Without ether, Maxwell's equations must be describing light travelling away from the source at c and that immediately gives you a ready explanation of MMX and symmetry.

While Lorentz's theory gave symmetry in the system of experience Einstein was not happy with that and tried to remove the asymmetry in the theoretical structure of Lorentz's theory. The difference between the two theories is that while Lorentz says it *appears* to every observer that he is stationary w.r.t the ether Einstein said "Lets just assume every observer IS stationary w.r.t the ether". That being exactly what the second postulate describes. His starting point was symmetry so every observer's relationship with the ether must be equally valid. He then spent 15 years trying to come up with a new ether concept which would do that. In 1920 he gave a lecture which shows that he was still trying.

"It may be added that the whole change in the conception of the ether which the special theory of relativity brought about, consisted in taking away from the ether its last mechanical quality, namely, its immobility. How this is to be understood will forthwith be expounded." Einstein's 1920 lecture:

The trouble is he didn't expound. All he did was to repeat the same statement in different forms.

".. the special theory of relativity does not compel us to deny ether. We may assume the existence of an ether; only we must give up ascribing a definite state of motion to it" Einstein's 1920 lecture:

"The hypothesis of ether in itself is not in conflict with the special theory of relativity. Only we must be on our guard against ascribing a state of motion to the ether." Einstein's 1920 lecture:

"... on the other hand there is a weighty argument to be adduced in favour of the ether hypothesis. To deny the ether is ultimately to assume that empty space has no physical qualities whatever. The fundamental facts of mechanics do not harmonize with this view. " Einstein's 1920 lecture:

"According to the general theory of relativity space without ether is unthinkable; for in such space there ..would be no propagation of light, Einstein's 1920 lecture:

The clearest statement of his justification for the second postulate comes in 1938

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"Light is a propagated wave propagated by a medium called the Aether. The velocity of a wave is a function of the medium which propagates it and its velocity can only be effected by the source if the movement of the source causes movement of the medium. Aether drag experiments, passing light close to heavy rotating flywheels has shown that they had no effect on the light passing close to them hence the speed of light cannot be effected by the speed of the source.

Although the speed of light might be expected to vary with the speed of the observer Michelson and Morley had shown that not to be the case so it is a strange but indisputable fact that the velocity of light is constant independent of the velocity of the source or the observer."
Infeld/Einstein - The Evolution of Physics. 1938

Later in the book he suggests, possible as a sop to people like you who hate the E-word that perhaps something which cannot be detected cannot be said to exist but this is false logic. It is only our speed relative to the ether which is undetected. Having justified source independence as being a property of the ether any experiment showing source independence has confirmed the existence of the ether.

"The speed of light is always constant w.r.t the source emitting it"
is completely consistent with the PoR and had not been ruled out by experiment.

It could be consistent with the PoR, but not with the M.E.

It is consistent with the PoR and to get Maxwell's equations to describe light travelling away from the source at c relative to the source all you have to do is assume that the source is stationary w.r.t Maxwell's ether.

And it HAS been ruled out by many experiments (just some idiots around here don't accept that <shrug>).

Not in 1905. In fact the only experiment worth considering that I am aware of took place in 1964 - and the interpretation of that is open to question.

The main evidence of source independence comes from the fact that a theory based upon an assumption of source independence has been very successful. The only embarrassment comes from the modern physicists denial of the ether which is ultimately the only justification for source independence. Lorentz came up with a theory, Einstein tried to come up with an improved version and failed. It appears that Lorentz's theory has stood the test of time and never been falsified - but that is not what

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students are taught.

Back to your latest posting

-- it was essentially Einstein all the way until the 11th hour when Hilbert joined in.

Just because Einstein used the word "ether" in one paper IN A FORUM ON ETHER does not mean that GR is an ether theory. Moreover, in that quote he explicitly states that what he called "ether" has essentially no relationship to the usual meaning of the word (in particular, it is not possible to measure "speed" relative to what he called "ether").

The emphasis tries to add a bit of spin but that statement is totally consistent with my understanding. Einstein was after a different sort of ether which did not imply a unique FOR stationary w.r.t it but it still needs to provide a physical process to wrest control of the speed of light from any influence the physical processes taking place in the source would otherwise have.

AFAIK that one quote is the only support anyone has for the claim that SR/GR is an "ether theory".

Then you did not read my above posting did you.

Certainly the theories themselves contain no quantity labeled "ether" or to which one could reasonably apply that label.

Of course not. The properties he required from the ether are incorporated in the second postulate which describes *exactly* what an observer will observe if he is stationary w.r.t the ether. You only 'get rid' of the ether from the theory by proposing an alternative physical process which will have the same effect on an observer as 'being stationary w.r.t the ether'.

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I accept that this is prejudice on my part and that there is a great deal of evidence supporting it.

There is not a single shred of evidence supporting any "ether theory" that does not also support SR/GR.

Relativity WAS an ether based theory, that is the whole basis of Einstein's thinking. Einstein downgraded it to a 'principle theory', a mathematical model, which makes no attempt to give a physical description. You therefore have two theories mathematically identical SR and LET which cannot be separated by the accuracy of their predictions which can only therefore be judged on the elegance of their physical interpretation - and relativity has none to offer.

The theory you call relativity started life as Maxwell's ether theory, that was 'fixed' by Lorentz to explain the MMX and Einstein extended the maths to include accelerating frames and gravity. Einstein's attempt to improve/simplify Lorentz's ether by proposing an ether which every observer can be stationary w.r.t failed so his contribution was in extending the maths.

IOW: the only viable ether theories known today are those that are experimentally indistinguishable from SR/GR.

Quite so. The only physical theories consistent with the mathematical models of SR/GR are ether theories.

What physical process makes the speed of light constant w.r.t the observer observing it?

That is a valid 'physics' question.

"the speed of light is constant in the observers FoR" is a description of the maths and a re-statement of the second postulate. The observers FoR is a mathematical abstraction mapping out real physical space. What is it in real physical space which provides the properties assumed in that mathematical description?

I would be less reluctant to accept the Maxwell/Lorentz/Einstein ether theory if I was certain that the alternative no ether, source dependent option had been properly evaluated.

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It has been tried and found wanting.

Please explain. Note that the success of a different theory does not rule out the possibility that this theory would not be equally successful given the necessary resources to develop it. Waldren thought so. The success of relativity could be put down to the fact that that is where all the effort has gone.

It appears that it wasn't for no better reason than Ritz's untimely death in 1909 and the fact that physicists generally were more comfortable continuing to believe in the ether which they had believed in for 200 years. I suppose it is human nature.

Nonsense. You clearly have no idea about how physicists think or act. YOU are no prototype for physicists, and projecting the way YOU behave onto real physicists is completely invalid.

I can see no other reason why anyone would accept a theory which ditches two axioms of physics in order to incorporate source independence when there was at the time no experimental evidence of source independence and there was a much simpler non ether, source dependent theory on offer - unless it fitted in better with what they already believed.

And relativity was a clear BREAK from the concept of "ether".

I have shown that not to be the case. See above. You do not make it so by constantly asserting that it is so no matter how deeply held your belief may be. Can you supply me with one quote where Einstein argues that there is no ether and explains why he still assumes source independence?

Ritz died in 1909 -- where is his theory today?
(nowhere, because it does not agree with numerous experiments)

No one even admits there is an alternative theory let alone routinely check whether results fit it.

Lorentz died in 192X -- where is LET today?

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As Einstein's attempt to find a 'mobile ether' failed and relativity became only a mathematical model then LET is alive and well but in these days referred to as 'relativity'. Einstein's contribution was to extend the maths i.e. GR

Einstein ceased working on GR in the 1920s -- where is GR today?

Exercise for the reader: explain why GR is so different from these other theories. If you cannot do that, then you have no inkling of what physics really is.

I think I have answered that.

Real physical theories are VASTLY more than their founders. You don't know what physics is until you understand why this is so -- physics is a _SOCIAL_ process. But its subject is physical.

I don't know what that means and I doubt you do. If by a 'social' process you mean that ideas come in and out of fashion without there necessarily being any logic involved that would indeed appear to be the case.

I do not believe that today's physics was preordained.

Hmmm. As long as faithfulness to the real world is the criterion of success, the constraints on physics are indeed "preordained". But the path and progress of physics are not, as physics is a _SOCIAL_ process and therefore highly dependent on the contingencies of history.

A very good case existed at the start of the 20th century for taking the no ether Source dependent route suggested by Ritz [...]

Except it does not agree with all of the experiments.

Let us distinguish here experiments intended to test Ritz's theory and

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the unjustified assumption that because relativity is successful Ritz's wouldn't have been. Also note that had Ritz's theory been adopted it would by now have had a century of development. We are totally unable to compare present day relativity with the theory which would have developed by now had Ritz's theory had the same development. My point is that had Ritz's theory been accepted there is no way I can see that it would ever converge with relativity no matter how many challenges were thrown up because the actual route to relativity makes no sense anyway.

--

John Kennaugh

"The nature of the physicists' default was their failure to insist sufficiently strongly on the physical reality of the physical world." Dr Scott Murray

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