Title:

The relentless ambiguity in special and general relativity discussions

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Conflating the measured speed of light with the actual speed of light

Einstein's two versions of his second postulate (the same conflation)

Einstein's ultimate embracing of Mach's viewpoint regarding totality

Perceptions cannot produce actualities

Einstein's ambiguous terminology in general relativity

GR's math seems conditioned on the constancy of the actual speed of light

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The relentless ambiguity in special and general relativity discussions

In the context of both SR and GR, the constancy of the *actual* speed of light in vacuo and free of gravitational influence is routinely conflated with the constancy of the *measured* speed of light in vacuo and free of gravitational influence – as if there were no distinction to be made (which of course is patently and easily verifiably false [1]). The terminology is continuously and perpetually ambiguous: The constancy of the speed of light is routinely (and in a relentlessly alternating manner) referred to as both the "observed" ("measured") speed and as simply constant – absent of the word "measured".

Identically, the "slowing of light" due to gravity is often referred to as the "measured slowing of light" – as though there were no distinction to be made (which again is patently false). The conflation and flip-flopping is routinely incorporated within discussions of local regions of space and within discussions of global regions of space. [2]

In fact, Einstein himself was continuously ambiguous regarding actual light speed and measured light speed in his discussions of both his special and general theory – despite his acknowledgements in 1911 and 1920 of Mach's correctness regarding an object's dependence on totality for its physical properties, and despite his (Eintein's) acknowledgement that Mach's viewpoint is a necessity in order for there to be “standards” for space and time (which Einstein regards as essential). [3,4] That is in stark contrast to today's interpretation of both SR (especially) and GR, which, as I discussed in the two previous paragraphs, is absurd double-talk.

In fact, as I've pointed out in several of my articles and in my book, Einstein actually formulated his second postulate of special relativity first as the constancy of the *definite* speed of light, then as the constancy of the *determined* speed of light and added the very telling quotes around "stationary system". [5] He proceeded to utilize only the latter version of that postulate in his treatment.

Einstein also stated in 1920, as he embraced Mach's viewpoint, that “space without ether is unthinkable” – which is in stark constrast to his 1905 and 1916 treatments of special relativity, and which of course is also in stark contrast to today's interpretation of special relativity.

Because Google AI is 100% dependent on the database of the nonsensical ambiguities, it will continuously and perpetually regurgitate the nonsense – conflating, flipping, alternating.. from one terminology to the other, talking out of both sides of its mouth – even when one plainly spells out (confronts it with) the ambiguity. It simply ignores that confrontation throughout the entire course of its flip-flopping answer. It is constrained by its worthless database regarding the matter.

When one asks Google AI whether the constancy of the actual speed of light in vacuo and free of gravitational influence is considered to be a meaningless concept – as per the standard interpretation of SR with its utilization of only the measured speed of light, it answers as follows:

"No, the constancy of the actual speed of light in vacuo and free of gravitational influence is not considered to be a meaningless concept. That is because the speed of light in vacuo and free of gravitational influence is actually constant as measured."

Thus, it seemed to understand the question, yet proceeded to not address the distinction I had raised between the actual and measured speed of light – neither in the context of flat space or gravitational space – as it continued its discussion. In other words, it utterly failed the logical dependency test with its meaningless answer.

One can read Einstein's entire paper on general relativity and will not be able to determine whether Einstein made such a distinction. His terminology is consistently ambiguous. I've seen no evidence that Einstein knew in what sense he was referring to the speed of light.

Since the constancy of the actual speed of light and the constancy of the measured speed of light are both true, Einstein's mindset regarding the matter is perhaps of no importance regarding the math – *in GR*.

One piece of evidence that indicates Einstein (consciously or unconciously) conditioned the modeling of spacetime strictly on *measures* of light speed is that there are solutions to his field equations that allow backward time-travel. Those solutions could not arise if the actual speed of light (and actual slowing of light) was the condition for his model. Or, such preposterous solutions might just reveal the limitation of his model – meaning the lack of separation of time from space.

Perhaps stronger evidence indicates that the *actual* speed of light is employed – that evidence being that gravitational potentials are treated as real, and that non-kinematical clock-slowing is obviously not a symmetrical measure between parties in different gravitational potentials. Rather, their non-kinematical clock-slowing is based on comparing their non-kinematical clock-rates to an imaginary clock at infinite distance which is not under any influence of gravity – meaning there is a real baseline for non-kinematical clock-rates.

Notes:

1. For the umpteenth time: Postulating the *actual* constancy of the speed of light (in vacuo and free of gravity), along with the resulting actual length-contraction and actual clock-slowing, necessarily implies the constancy of the *measured* speed of light (in vacuo and free of gravity), along with symmetry of measure across inertial frames and the actual kinematical time-keeping differential between reunited clocks.

In contrast – a postulated constant measured speed of light does not imply a constant actual speed of light, and cannot explain the time-keeping differential.

The deal-breaking significance of the actual kinematical time-keeping differential is never acknowledged by today's physicists.

There is nothing relative or merely "apparent" about the time-keeping differential. And only actualities – regarding the speed of light and clock-slowing – can produce an actual time-keeping differential. Perceptions cannot produce actualities.

In fact, only the above-mentioned actualities can explain symmetry of measure across inertial frames.

2. Identically, the actual *non*-kinematical time-keeping differential proves the actuality of gravitational clock-rate-slowing, rather than something that is a symmetrically measured effect – a symmetrical perception – between two parties in different gravitational potentials. It necessarily implies the actual nature of the speed of light and subsequent actual clock-slowing in a gravitational field. Again, perceptions cannot produce actualities.

3. Einstein, A., Lorentz, H.A., Minkowski, H., and
Weyl, H. (1923). Arnold Sommerfeld. ed.
The Principle of Relativity. Dover Publications.
Mineola, NY. pp. 112-113.

4. Einstein, A., Lorentz, H.A., Minkowski, H., and
Weyl, H. (1923). Arnold Sommerfeld. ed.
The Principle of Relativity. Dover Publications.
Mineola, NY. pp. 158-159.

5. Version 1: “Light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body.”

Version 2: “Any ray of light moves in the "stationary system" of coordinates with the determined velocity c, whether the ray be emitted by a stationary or by a moving body.”

Einstein, A., Lorentz, H.A., Minkowski, H., and
Weyl, H. (1923). Arnold Sommerfeld. ed.
The Principle of Relativity. Dover Publications.
Mineola, NY. pp. 38, 41

See sitemap for my other articles:

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Twins paradox animation – and simple equation

Citation and annotation for the book *Relativity Trail*