

Review of: "Paradigm shift in Special Relativity: From the Michelson-Morley experiment, Lorentz and light speed invariance, to the reciprocal linear Sagnac effect and conservation of simultaneity"

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This paper by Spavieri and Haug is very interesting. These researchers have been examining the Sagnac effect and related issues for some time and such research in general represents important contributions to space-time physics. My comments on their paper are as follows:

1. I think history has shown that changing an accepted theory is a very difficult proposition and therefore such theories often maintain their "validity" for long periods as has happened with special relativity.
2. The classical principle of relativity is known to hold for mechanical systems. Einstein in his principle of relativity postulate extended the classical principle to electromagnetic and other natural phenomena, not using experimental evidence, but because he believed that "a principle of such broad generality should hold with such exactness in one domain of phenomena and should be valid for another is apriori not very probable." The existence of the ECI frame which is a preferred frame that is critical in the operation of the GPS immediately invalidates this extended postulate which prohibits the existence of preferred frames i.e. all inertial frames must be equivalent.
3. In section 2.1, please note that strictly speaking, the light speed constancy postulate applies to observers in uniform motion.
4. In section 2.1, Einstein synchronization is valid for the case where one-way light speed is c as for example in the ECI frame or for light travelling in a North-South direction on the surface of the Earth.
5. In an attempt to escape possible one-way light speed variation, Edwards for example derived the LTs using two-way light speed constancy. However, the LTs predict one-way light speed constancy and therefore do not escape light speed non-invariance issues.
6. I do agree that most physicists believe that one-way light speed constancy has been confirmed. However Zhang makes it clear in his book reviewing experimental evidence supporting special relativity that while two-way light speed constancy has been confirmed, one-way light speed constancy has not.
7. In support of the arguments in section 3.1, I wish to point out that the LTs can be transformed to a rotating platform where they predict constant light speed. This means the LTs predict no Sagnac effect which is wrong.
8. That the LTs and the LTAs are not equivalent is easily demonstrated by the fact that they make different one-way light speed predictions which can be tested using the synchronized clocks of the GPS. These clocks give light speed $c-v$

east and $c+v$ west (where v is the surface speed of the Earth at the particular latitude) and not c . The availability of these synchronized clocks seems to be a well kept secret!