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Amending Einstein's Flawed Version of Relativity Theory

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Opinion

It is easy to show that Einstein's theory of relativity [1] and the Lorentz Transformation (LT) on which it is firmly based are not internally consistent and therefore invalid. Consider the following application. An observer on a train passing by a station measures the speed of light by recording the elapsed time T it takes for a pulse to move a distance of L on the floor of a compartment. He finds that the speed of light is equal to the standard value of c by computing the ratio L/T. According to Einstein's theory, an observer at rest on the station platform will obtain a smaller or equal value of the distance traveled by the light on the train by virtue of Lorentz contraction but a larger elapsed time because of time dilation. Nevertheless, his theory also holds that the observer on the platform will obtain the same value of c for the light speed. This result is clearly impossible, however, as the ratio of distance to time based on the platform measured values must be smaller than the ratio obtained on the train on this basis [2].

The ease with which the above proof goes through raises an interesting question, namely why do many physicists continue to argue that Einstein's theory is correct? One reason is that there have been many claims based on experimental evidence which seem to verify both the theory and the LT on which it is based. It is important to recognize in this context that verifications of a physical theory of any kind do not constitute its validity, however. The accepted procedure in mathematics is to identify a premise which upon application of standard logical methods leads to a contradiction. If agreement with the theory is the result instead, it is simply not admissible to make any decision about the correctness of the theory on this basis alone. Such a contradiction is reached in the previous application of Einstein's theory, therefore unquestionably proving that his theory is not valid.

One of the great advances made by Einstein in his 1905 paper [1] was to introduce the Relative Velocity Transformation (RVT). It relates the three velocity components of two observers who are in relative motion to one another. The RVT is obtained directly from the LT by dividing the three spatial components of each observer by the corresponding time variable. In 1907 von Laue [3] applied Einstein's theory to successfully resolve long-standing questions about the damping effect on the speed of light passing through water. It is important to recognize, however, that von Laue used the RVT to arrive at this conclusion and not the LT directly. The precursor to the LT introduced by Voigt in 1887 [4] can be used in the same manner to also derive the RVT, so it is not correct to claim that von Laue's success is a unique confirmation of the LT. In other words, the RVT can just as well be claimed to be a product of Voigt's transformation. Moreover, the modern experiments involving high-speed collisions of elementary particles constitute verifications of the RVT as opposed to the LT because only speeds of the particles are involved. It therefore makes sense to use the RVT as an organizing principle of relativity theory since there is no contradiction which stands in the way of this conclusion [5].

There is a second area in which Einstein's theory is deficient, namely his claim that the speed of light is the same for all observers regardless of their state of motion relative to the source [6]. Assume that both the observer and the light source are initially located at the same point in space. The source then moves away from the observer with speed v at the same time that it emits a light wave in the same direction. According to Einstein's assumption, the light pulse will be separated by a distance of cT from both the observer and the source after time T. This is impossible, however, because the source is now separated from the observer by a distance of vT.

By the same argument, it is clear that the light pulse itself is separated by a distance of cT+vT from the observer, so its relative speed is v+c over this period. This state of affairs is at odds with the common assumption that in relative theory that nothing can travel faster than c, but the result is based on basic assumptions regarding the relationship between speed, time and distance, so it is an unavoidable consequence. Accordingly, two light pulses moving toward each other have a relative speed of 2c.

This does not mean that von Laue's finding discussed above is in any way cast in doubt, however. It merely shows that there is a fundamental distinction between the two cases.

The light-damping experiment involves a measurement of the light speed under two different conditions, namely with and without the motion of water in the apparatus, whereby the relationship between the two values is computed with the RVT. It is not possible that the light speed will be found to be greater than c in either case. The situation discussed above involves a measurement of the light speed *at the same time by two different observers.*

The total speed of the light pulse relative to the observer is simply obtained by adding the two distances and dividing by the elapsed time. This is an example of standard vector addition in mathematics. In this connection, it should be noted that all evidence, including the Michelsson-Morley experiment [7], is consistent with the conclusion that light in free space always travels with speed c relative to its source (also after colliding with mirrors).

Another key deficiency in Einstein's theory is its failure to recognize the importance of the Law of Causality [8]. Newton used it to introduce his First Law of Kinetics, whereby it is assumed that an object will continue at constant speed in a straight line until it is acted upon by an external unbalanced force. It can also be applied to the properties of objects such as clock rates. The resulting Corollary holds that the rate of a clock will remain unchanged as long as it moves at a constant velocity (inertial clock). Two such clocks are employed in the LT and the Voigt transformation, from which one can conclude that the ratio of their rates (Q) is a constant as well.

This means that when the clocks are used to measure the elapsed time of a given process, their respective values ($\Delta T'$ and ΔT) will always differ by the same ratio, i.e. $\Delta T' = \Delta T/Q$. This expression is referred to as *Newtonian Simultaneity* because it requires that if one of the time differences is zero ($\Delta T' = 0$), the other must be so as well. Newton was a firm believer in the assertion that any process in the universe occurs at the same time in every other rest frame. This conclusion is inconsistent with the LT, however, and Einstein and his followers denied Newton's concept on that basis (Remote Non-simultaneity or RNS). The above argument shows, however, that RNS is not consistent with the Law of Causality.

The Newtonian Simultaneity relation has had two key applications in relativity theory. It has been combined with the RVT to form a replacement for the LT. As such it is consistent with the goal of having the same value of the light speed for both observers, while at the same time guaranteeing that all events occur simultaneously for them. The resulting set of space-time equations is referred to as the Newton-Voigt Transformation (NVT) [9]. It is also consistent with Galileo's Relativity Principle, something that is lacking in the original Voigt transformation. The mixed space-time character of the LT is eliminated through the direct inclusion of the Newtonian Simultaneity relation.

The contradiction pointed out with the LT is removed by its inclusion in the Uniform Scaling Method, but before this can be accomplished, it is necessary to provide a value for the constant Q in the proportionality relation. This needs to be done with the help of experimental information in the form of the Universal Time-dilation Law [10]. It relates the elapsed times of two clocks in different states of motion. For example, the results obtained with circumnavigating airplanes [11] have shown that the elapsed time of a given clock is inversely proportional to $\gamma (v) = (1-v^2c^{-2})^{-0.5,}$ where v is the speed of the clock relative to a particular rest frame (Objective Rest Frame). The assumption in the Method is that a definite value of Q exists for every pair of rest frame in the entire universe *on an instantaneous basis.* It is useful to look upon Q as a *conversion factor* between the units in the two systems. In this vein it is important to see that the *reversed role* factor Q' is always the reciprocal of the forward. This is consistent with the Newtonian Simultaneity relation since reversing the roles in this case leads to the relation.

$\Delta T= \Delta T'/Q'$. After substitution in the original equation, the result is $\Delta T' = \Delta T'/QQ'$, which therefore requires that $QQ'=1$. Such a reciprocal condition is standard in every-day life, for example in currency conversions, but it stands in stark contrast with Einstein's version of the theory, whereby the moving clock always runs slower than the observer's own clock (Einstein's Symmetry Principle).

No conversion factor is required for the speed of light, or relative speeds in general, since the two observers always agree on its value. This means that the conversion factor for distance must also be equal to Q so that the ratio of distance to time is the same for both observers. Experiments [12] carried out with electrons indicate that their inertial mass increases with acceleration at the same rate as lifetimes, which therefore indicates that the conversion factor for this property is also Q. The corresponding factor for any other physical property can therefore be deduced from knowledge of its composition in terms of the three fundamental properties of distance (r), time (t) and inertial mass (m) [13]. For example, since the energy of a particle is defined as the product of its inertial mass and the square of its speed, its conversion factor is equal to $Q\ (Q^0)^2 = Q$. The same is true for linear momentum (mv), whereas the conversion factor for angular momentum (mvr) is Q^2.

There is an analogous development based on gravitational acceleration. The fundamental quantity is S instead of Q. It is equal to $1+gh/c^2$ for small height differences h, where g is the local acceleration of gravity. The initial idea in this case came from Einstein and his 1907 paper [14] in which he introduced the gravitational redshift of frequencies of light emanating from the sun. For astronomical distances, $S= A^o/A^p$, where $A^i = Gm_0/c^2r_i$: G is the gravitational constant, m_0 is the gravitational mass of the sun or planet and r_i is the distance separating the object from the latter (o stands for observer and p for the planet). Einstein concluded that a frequency ν of light located near the sun has a value of Sν near the earth and this difference is due entirely to the difference in the units of time employed at the two locations. The same holds true for energy and light speed. The corresponding scale factors for any other physical property can be deduced on the basis of its composition in terms of terms of these three fundamental quantities, in analogy to what has been described above for the effects of kinetic acceleration.

The two types of acceleration are completely independent of one another. This was verified in the experiments with circumnavigating airplanes [11]. As a consequence, it is possible to use the two types of conversion factors as products in each case. The main examples for Z are distance

(Q), time (Q/S), inertial mass (Q/S), frequency (S/Q), energy (QS), velocity (S), linear momentum (Q), angular momentum/Planck's constant (Q^2), linear acceleration (S^2/Q), force (S), Universal Gravitation constant G (S^2Q), gravitational mass (1), pressure (S/Q^2). Note that all these Z factors cancel in all laws of physics. This suggests a generalization of Galileo's Relativity Principle [15]: *The Laws of physics are the same in each inertial system, but the units on which they are based vary in a systematic manner from one system to another.*

Note that the Z factor for time is used expressively in the pre-correction procedure of the Global Positioning System. More details of the topics expressed in this discussion will be given in a future article to be published by the author in this journal.

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