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Special Relativity is a Classical Theory

Yuri Keilman
AltSci@basicisp.net

Quantum Theory is not a classical theory. It contains illogical steps, but it has excellent experimental confirmation. General Relativity (GR) also is not a classical theory because it contains illogical steps. In my opinion, GR's experimental confirmations are very weak. Special Relativity (SR) does not contain illogical steps and has excellent experimental confirmation but an illogical mask was placed over it by Einstein. Therefore I'll try to explain the real meaning of SR. SR is the result of the realization that time is not independent of terrestrial coordinates x, y, z. Time can only be treated as one of coordinates of 4-d space. The earlier concept that time had independent physical meaning, that time is a parameter (this concept was used by Lorentz) led to the Galilean transformations (time is the same in both coordinate systems: t'=t, x'=x-vt). But if time is one of coordinates of 4-d space, then one has to use the mathematics of 4-d space (the math of n-d space was known before 1850 when Riemann used it to create his Riemann Geometry). Galilean Transformations have no regard for 4-d geometry. The transformations can not be arbitrary (note that rotation in x-y plane is: x'=xcos(fi)+ysin(fi); y'=-xsin(fi)+ycos(fi); It is unique).

To Einstein it appeared that to find the right transformations in the t-x plane was the most important thing. For that reason he introduced his 2 postulates. The metric tensor appeared later.

From the point of view of 4-d geometry the most important thing is the metric tensor. Without knowing the one, the geometry can not be used. In 3-d Euclidean space the metric is diag(1,1,1). It is so simple that all math operations can be set up without even mentioning the metric. One thing is excluded: If one asks the question "why is the rotation transformation unique?", then the proper answer will be: "Because it does not change the components of the metric tensor". The next question is: "Why is it important that the components of the metric do not change?" The answer is: "Because otherwise the calculations will be 10 times more complicated and few know how to make these calculations".

The same in 4-d space. The metric diag(1,-1,-1,-1) or diag(-1,1,1,1) can be obtained from Maxwell's equations if we try to write them in 4-d notation. Then the Lorentz Transformations can be found as those that do not change the components of the metric. Note that Einstein's postulates are not nessessary.

Terminology warning: In 4-d geometry, a physical clock measures only "proper time". The term "time" has no physical meaning (because x,y,z are missing). In the same way, the term "x" has no physical meaning (because y,z,t are missing).