Re: A Derivation of Special Relativity without Invoking Group Theory

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Eugene Shubert wrote:

>>Nobody ever said anything about spacetime, itself, having a group
>>structure.
>>
>>
>
>Is spacetime a geometry?
>Does geometry have a group structure?
>Do groups have a group structure?
>
>Consider what the following nobodies have said:
>
>"The geometry of Minkowski space is defined by the Poincaré group."
>http://en.wikipedia.org/wiki/Poincar%E9_group
>
>"Every geometry is defined by a group of transformations, and the goal
>of every geometry is to study invariants of this group." Klein,
>Erlanger Program.
>
>"Each type of geometry is the study of the invariants of a group of
>transformations; that is, the symmetry transformation of some chosen
>space." Stewart and Golubitsky 1993, p. 44.
>
>"A geometry is defined by a group of transformations, and investigates
>everything that is invariant under the transformations of this given
>group." Weyl 1952, p. 133.
>http://www.everythingimportant.org/relativity/special.pdf
>
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>

As long as it is possible for different inertial observers to build networks of clocks and rulers which are at rest relative to themselves, then these clocks and rulers will define different coordinate systems

for different observers, and there must be some equations to transform between the coordinates of an event in one system to the coordinates of the same event in another system. These coordinate transforms will have a group structure, as Tom Roberts said earlier. And since the coordinate systems are defined in terms of physical clocks and rulers, the transforms are determined by the laws of physics (or, equivalently, by the geometry of spacetime).

Jesse