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A Short Note on Mathematics of Rival Theories of Relativity

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Description

In the framework of the Lorentz isometry group, relative velocity has two different concepts with respect to the axiom of the involute inverse: one is a quasigroup of reciprocal velocities, and the other is a groupoid of non-reciprocal velocities. Another third definition of velocity exists within the non-isometry groupoid of splits, which leads to the groupoid of non-reciprocal velocities. This third rival theory goes beyond relativity and is based on the isometry group hypothesis. The sum of reciprocal velocities is a non-associative operation. The addition of non-reciprocal velocities, on the other hand, must be associative. All concepts of relativity theory take on different mathematical and philosophical definitions within the framework of the groupoid of non-reciprocal velocities. Instead of what we are used to in the sense of group-theoretical methods in physics. The dynamics within groupoid, in particular, do not require either a concept of 'ordinary' space or a concept of time, because what groupoid requires is only absolute space-time.

The present a number of alternative philosophical perspectives on fundamental concepts in relativity theory, kinematics, and the meaning of Lorentz isometry-group versus groupoid of non-reciprocal velocities. This mathematical treatise is not about pure mathematics, but about physics. The physicist's vocabulary includes terms like length, angle, velocity, force, work, potential, current, and so on, which we will refer to as physical quantities. Some of these terms appear in pure mathematics, and in that subject, they may have a broader meaning that we are not concerned with here. The pure mathematician works with ideal quantities, which he defines as having the properties that he chooses to assign to them.

However, in an experimental science, we must discover properties rather than assign them, and physical quantities are defined primarily by how we recognize them when confronted with them in our observations of the world around us. Consider the length or distance between two points. It is a numerical quantity associated with two points in nature, and we are all familiar with the procedure used in practice to assign this numerical quantity to two points in nature. A definition of distance will be obtained by stating the exact procedure that clearly must be the primary definition if we are to ensure that the word is used in the sense that everyone is familiar with.

The pure mathematician takes a different approach he defines distance as an attribute of two points that obeys certain laws, the axioms of the geometry that he has chosen, and he is unconcerned about how this "distance" manifests itself in practical observation. In his own investigations, he takes care to use the word consistently, but it does not always denote the thing that the rest of humanity is accustomed to recognizing as the distance between two points. To determine any physical quantity, we perform certain practical operations followed by calculations. These operations are referred to as experiments or observations depending on how closely we control the conditions. The discovered physical quantity is primarily the result of our operations and calculations.

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