

Principle of Relativity

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e.falkner@online.de

Relativity principle demands: All motion in absolutely empty space is relative, or, it is impossible to find out whether an observer is at rest or is moving at constant speed. Einstein accepts the principle, but he claims: Moving clocks go slower than the clocks that do not move. This claim contradicts the relativity principle - if it is not possible to know which clock is moving, how is it possible to say that a clock is moving? To escape this problem, it was necessary to make new assumption: All clocks “see” other clocks going slower if they are “moving” relative to it. But the other clocks “see” this clock moving and thus this clock must go slower. The problem is known as twin paradox, and it is unsolvable. When a clock goes slower than another clock, it is not possible that the other clock goes slower than this clock at the same time. After the contradiction was pointed out to Einstein, he found new excuses again and again in order to keep his theory “sacrosanct.”

Einstein’s first postulate says: *“The laws by which the states of physical systems undergo change are not affected, whether these changes of state be referred to the one or the other of two systems of co-ordinates in uniform translational motion.”*

The postulate is identical with the classical relativity principle. What the postulate does mean? If we regard an object that moves in a coordinate system S_1 at speed v along x -axis in positive direction we will measure $w - v$ in a coordinate system S_2 that moves at w along the same x -axis in positive direction. If an object moves at v in S_2 it will move in S_1 at $w + v$ because S_1 moves in negative direction in S_2 . The speed of the same object can by no means be equal in two coordinate systems that move relative to each other at the same time.

It can easily be shown that “first” postulate is incomplete if we apply it on propagation of waves; for example, water waves. Regarding the waves from different coordinate systems, we will see that there is only one reference frame in which the speed of waves is constant. There exists a preferred reference frame. Only coordinate systems in which all physical properties of the “system” are equal can be regarded as equivalent. The speed of water waves can only be constant in a coordinate system in which the water is stationary. This rule must be valid for all other waves because all waves are described by the same wave equation. Especially the equation for electromagnetic waves presupposes a stationary ether [1]. If waves, or any other moving object, are regarded from another reference frames, Galilean transform must be applied. Moving observer relative to the preferred reference frame, will see $c - v$ relative to his own reference frame (coordinate system).

When sound waves in air are considered and if an observer measures constant speed of sound, the air must be stationary with respect to observer. That means, the air must be held by a force in a limited part of the space. For example, enclosed in a container. Outside of the container the air is normally not stationary, and the speed of sound in the outer air cannot be constant relative to the observer. If two containers are moving relative to each other, the speed of sound in any container will be constant inside the container, but not constant relative to another container. If sound is interchanged between two containers the speed of sound changes twice, but remains everywhere constant relative to the local medium.

The same consideration must be applied to electromagnetic waves in ether. If ether is stationary relative to a body, the speed of light is constant relative to that body. Many experiments have shown that the speed of light is constant relative to earth-centered, non-rotating coordinate system. The special property of that system is the stationary gravitational field. The gravitational field is so strong that it is capable of carrying along local ether, so the space around the earth can be regarded as a container filled with ether. The same must be valid for other planets and probably for the moon too because the properties of all these systems are very similar. If moving object is too small it cannot attract the ether and the object moves through the ether without resistance. It is, for example, the case when Sagnac device rotates in the ether (the relative circulation of the luminiferous ether in the closed circuit) or when the water flows through the ether (Fresnel's drag coefficient: Water electrons are moving through the luminiferous ether).

In 1854 W. Thomson wrote [2]: *“That there must be a medium forming a continuous material communication throughout space to the remotest visible body is a fundamental assumption in the undulatory Theory of Light. Whether or not this medium is ... a continuation of our own atmosphere, its existence is a fact that cannot be questioned, when the overwhelming evidence in favour of the undulatory theory is considered ... ”*

Einstein claimed that the ether is not necessary for his theory. In 1909 he said [3]: *“Today, however, we must consider the ether hypothesis as an overcome point of view. It is even undeniable that there is an extended group of radiation-related facts which show that the light has certain fundamental properties which can be understood far more from the point of view of Newton's theory of emission of light than from the point of view of undulation theory. Therefore, it is my opinion that the next phase of the development of theoretical physics will bring us a theory of light which can be understood as a kind of fusion of undulation and emission theory of light.”*

Later Einstein changed his mind and claimed that the physics without ether is not possible. Anyhow considering his second postulate we can conclude that coordinate systems are not equivalent. The system of the observer is preferred reference frame because in this frame the speed of light is constant according to Einstein, no matter how the observer is moving. This contradicts relativity principle; the velocities must be transformed according to Galilean transformation. Motion of the observer cannot “regulate” speed of light without carrying along the surrounding physical space. Empty space has no properties and it cannot be regarded as physical space, consequently it cannot move. Contrary to this the motion of the source could regulate speed of light but only if Newton's emission theory be valid. The speed of light would be constant relative to the source, but this view was disproved by various experiments. Einstein simply reversed the roles of source and observer and detected an impossible “theory.” Einstein had many powerful helpers at that time (Planck, Laue, Sommerfeld, Eddington) and the theory survived until today. The damage to the science is immense, and no change is to be expected in the near future.

According to principle of relativity the speed of the same object cannot be equal in two reference frames at the same time. Two frames of reference are only equivalent when all physical properties of the frames are absolutely equal. If we regard sound in air, the air must be at rest with respect to the coordinate systems to make these systems equivalent. In case of light, the “spacetime” must be at rest relative to the coordinate system in which the speed of light is constant (“spacetime” is the new name for all kinds of ether). Only in this case, the physical laws are independent of the state of motion of a coordinate system, but that means at the same time that Galilean transformation has to be applied in order to correctly transform between coordinate systems. All theories that are questioning Galilean transformation are incomplete or wrong.

References

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3. A. Einstein: "Über die Entwicklung unserer Anschauungen über das Wesen und die Konstitution der Strahlung" [On the Development of Our Views Concerning the Nature and Constitution of Radiation]. *Physikalische Zeitschrift*. 10: 817–825 (1909).