The use of non-standart clock synchronization according Hans Reichenbach in the integral covariant formulation of conservation laws

Stepanov Valery

North Eastern Federal University, Yakutsk Russia

The 3rd International Conference on Particle Physics and Astrophysics,

2-5 October 2017, Moscow, Russia

- In 1930, Reichenbach established the possibility of generalization of Einstein's definition of synchronizing spatially separated a couple of hours, introducing Reichenbach parameter that varies from zero to one, which defines one-way speed of light. A fundamental constant is the average speed of light back and forth. The independence of this observed value of the choice of inertial reference systems supported by the Michelson-Morley experiment.Then John A Winnie in 1970, formulated a generalization of the special theory of relativity to the case of generalized synchronization Reichenbach. Currently, there is discussion about the consistency with the physical experiments of Reichenbach's thesis of the conventionality of simultaneity spatially separated clocks.

- Without entering into this discussion about the physical reality according to Reichenbach's thesis in this paper, we propose the possibility of using non-standard synchronization in the relativistic - invariant integral formulation of the laws of conservation of charge, the energy - momentum, and other conserved quantities.

$$t_{b0} = t_{a0} + \frac{1}{2}(t_{a1} - t_{a0})$$

$$t_{b0} = t_{a0} + \xi_{AB}(t_{a1} - t_{a0})$$

$$\xi_{AB} = \frac{1}{2} - \frac{V}{2C}$$

- For two inertial reference systems, the relativity of simultaneity phonological paradigmatic events.Richard Feynman in the book give an example of the departure of electron-positron pair from the two ends of the rod of finite length. On the basis of the fact of the relativity of simultaneity of these two events, he concluded that the local law of conservation of electric charge for non-point objects.

- Consider the insular system of mutually motionless particles. The law of conservation of charge for this system in differential form is expressed as the vanishing of the divergence of a four-vector volumetric current density. To calculate the integral formulation of the integral over the four-volume tube world lines of particles insular system, forming a four-cylinder. This cylinder ends of two perpendicular to the world lines of the surfaces of simultaneous events belonging to the two points in time of the observer in his own frame of reference insular system. The lateral surface of the cylinder tends to spatial infinity, where the charges are zero. In the four-dimensional Gauss theorem the volume integral is converted to the integral over a closed surface, decaying on the lateral surface and two bases. The result is an equality of two integrals over the three-dimensional hypersurfaces for different points in time. This means consistency, i.e the conservation of the total charge insular system.

- If we move to the laboratory reference system relative to which the insular system is moving inertially, then the hypersurface of simultaneity used in the insular system, cease to be orthogonal to the temporal axis of the laboratory system. Because of the relativity of simultaneity there is an unequal one second parameter Reichenbach, the speed of light is a fundamental constant is only an average. The hypersurfaces of simultaneity in the four-dimensional Minkowski space are invariant geometric objects. In the area of the relativity of simultaneity, you can choose any hypersurface, while the numerical values of the integrals of the remaining quantities do not depend on the choice of hypersurfaces of simultaneity. Thus, if you declare a custom setting for the Reichenbach physically invalid, it returns solemnly to ensure the covariant integral formulation of the conservation laws of physical quantities.