

## RECONCILIATION BETWEEN RELATIVISTIC ETHER AND LORENTZ'S ETHER

In the general theory of relativity, the gravitational field generated by a material point of mass  $M$  is described by the metric tensor  $g$ , whose components  $g_{\mu\nu}$  vary according to space and time, defining the metric character (curvature) of Four-dimensional continuous space-time.

In the relativistic ether, the space-time is a field with energy and therefore, for the equivalence principle ( $E=mc^2$ ) of special relativity, the field has mass.

From the point of view of general relativity theory, a space like that of special relativity, isn't a space without field, but it is a particular case of field described by tensor  $g$ , therefore it has mass.

Let  $J_\zeta = |J_\zeta| m^3 / \text{Kg}$  be the ether of special relativity, then the value of  $J_\zeta$  will have to vary due to the presence of mass, because in a gravitational field the components  $g_{\mu\nu}$  vary according to space and time.

Thus, if  $\Delta t$  is the time interval elapsed in the ether  $J_\zeta$ , as the value of  $|J_\zeta|$  varies in a gravitational field, the value  $\Delta t$  of time interval elapsed will have to vary.

Therefore, we deduce that time is a property of ether and it is not a function of the velocity of the particle that passes through it.

Albert Einstein did not accept the stationary ether of Lorentz because it contradicted the relativity principle. In fact, Lorentz's contraction involves the existence of an ether in motionless.

Let  $O$  be a clock in motionless respect to a Cartesian axes system  $Oxy$  and  $O'$  a clock in motion with velocity  $V$  respect to the reference frame  $Oxy$ .

The two clocks  $O$  and  $O'$  are synchronised, when they coincide with the origin of  $Oxy$ . So for special relativity we obtain  $t_0 = \Delta t = \Gamma t_0'$ .

$t_0$  is the time of the clock, while  $t_0'$  is that of the clock  $O'$ .

For any particle the value of ether  $J_\zeta$  isn't a function of the velocity of this particles, then the time of clock  $O'$  must be  $t_0' = \Delta t$ .

Because the relativistic effect of special relativity does not cancel out, for the clock  $O$  we must assume  $\Gamma t_0 > t_0' = \Delta t$ . Thus  $V_0' = x / \Gamma t_0$ .

Being time a property of ether  $J_\zeta$ , that does not function of the velocity of the particle, then also the time elapsed for  $O$  must be  $t_0 = \Delta t$  and therefore for clock  $O$ ,  $x / \Gamma$  is the space covered by clock  $O'$ , in the time interval  $t_0 = \Delta t$ .

We deduce that we can consider the ether in motionless respect to any reference frame and so the relativistic principle is still valid.

In this way the stationary ether agrees with the relativistic ether.

Reference: LUDWIK KOSTRO; title: Einstein and the ether.

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