GRUSHKA Ya.I. [1]

Generalized Lorentz Transforms and Application of Changeable Sets for Mathematically Strict Foundation of Tachyon Kinematics

[1] *Institute of Mathematics, Kyiv, Ukraine*
E-mail: grushka@imath.kiev.ua

We investigate the generalized Lorents transforms in Minkowski space time $\mathcal{M}(\mathfrak{H})$ over any real Hilbert space $\mathfrak{H}$, which in the particular case $\mathfrak{H} = \mathbb{R}^3$ have been introduced in the papers of M. Hill, Barry J. Cox and E. Recami. The set of generalized Lorents transforms $\mathfrak{OT}(\mathfrak{H})$ include the classcal Lorents group $\mathfrak{O}(\mathfrak{H})$ over $\mathcal{M}(\mathfrak{H})$, and these transforms may be considered as generalization of classcal Lorents transforms for the case, where the velocity of reference frame exceeds the speed of light [1]. We can prove, that, unlike the classical case, the set $\mathfrak{OT}(\mathfrak{H})$ do not form a group of operators in the space $\mathcal{M}(\mathfrak{H})$ [2]. Nevertheless, using the theory of changeable sets [3], we can construct mathematically strict model of kinematics, which include the classical kinematics of special relativity, and allows superlight motion of inertial reference frames. But, since $\mathfrak{OT}(\mathfrak{H})$ is not a group, the last kinematics do not satisfy the relativity principle in the superlight diapason.

[1] Grushka Ya.I. *Tachyon Generalization for Lorentz Transforms*. Methods of Functional Analysis and Topology. **19**, no. 2, (2013), p. 127-145.

[2] Grushka Ya.I. *Algebraic properties of tachyon Lorentz transforms*. Proceedings of Institute of Mathematics NAS of Ukraine. **Vol. 10**, no 2 (2013) (in Ukrainian).

[3] Grushka Ya.I. *Abstract concept of changeable set*, Preprint: arXiv:1207.3751v1, 2012 (http://arxiv.org/abs/1207.3751v1).