

# Invariance Principles and System Analysis of Realization of Physical Laws Symmetry for Contemporary Signal Energodynamics

Y. Dragan, V. Bezruk, M. Medykovskyi, L. Sikora, B. Yavorskyi

**Abstract** - There is shown the cause and effect of some kind bifurcation and even dissociation of physicists thinking which have been provoked by pandomination of so-called general relativity theory. A system analysis of invariance concept and term origination instead of relativity ones and real perceiving of physical laws symmetry for investigations and its necessity for education process is given.

**Keywords** - Physical Laws, System Analysis, Principles, Contemporary Signal.

## INTRODUCTION

Many scientists (mainly physicists) and engineers have contributed to the arising and development of electromagnetic theory and to invention of wireless telecommunication. But physics is the unique substratum of all technical applications. From the inertial law in mechanics it follows the invariance with regard to rectilinear and uniform motion e.g. the motion of Sun does not reflect on planets motion. Situation has been substantially changed with appearing of electromagnetism - in experimental investigations of Faraday and theoretical works of Maxwell, summarized in Maxwell's equations. Some later Hertz by producing wireless waves validates the theory of Maxwell. This leads to invention of wireless signaling by means of Hertzian waves. And simultaneously from here by works of Lorentz and especially of Poincaré commenced real investigation of physical laws symmetry which describes such their property (we can say even their peculiarity) as invariance. But, by the way, herewith the physics (being stimulated by the experience obtained in the process of setting of quantum theory and its application to atom investigations) divaricates into signal energodynamics which results into radiocommunication and into another branch namely in researching space - time relations which has been called extraordinary unfortunate as relativity theory.

Above mentioned circumstances call forth the urgent necessity to expose this phenomenon to detailed system analysis. Therefore in this publication which represent somewhat extended and completed version of the report [1], the role of sections of modern physics, which have become standard in publications of researchers and educators, including a section that has become standard under unsuccessful name "relativity theory" and was originated from the theory of Faraday-Maxwell electromagnetism to be analyzed. Entire modern radio physics with the theory of signals as its foundation comes from it due to works of Heaviside and Hertz. But the steep bias, taken by physicists-theorists towards the so-called general relativity theory and cosmology (after Einstein), has broken the relations between these areas so hardly, that serious

problems of the theory of signals have fall out from the view of physicists, and students including PhD students have difficulties in wade through relativity terminology. Although a trend of research of invariance (or, in fact the same as symmetry) of physical laws and not only in this issue, but in all areas of physics (started by Poincaré) is still developing as if separately. Therefore a system analysis of this phenomenon is required.

## CONCLUSION

Facts which presented by Feynman as well as by Wigner (Nobel Prize winner, 1963 for the application of fundamental principles of symmetry) confirm the perspective (and productivity) of this way in radio electronics on the whole, and in theory of signals in particular, and the necessity of more complete using of these principles in investigation and education processes.

## REFERENCES

- [1] Dragan Ya., Medykovskyi M., Sikora L., Yavorskyi B. On Lorentz-invariance and symmetry of physical laws in signal energodynamics. Proc. of the Xth intern conf. "The experience of designing and application of CAD systems in microelectronics", publ. of Polytechnic nat. univ. Lviv, 2009p. 80-81.
- [2] Dragan Ya., Sikora L., Yavorskyi B. Foundations of contemporary stochastic signal theory: energy concept, mathematical tools, physical interpretation / The Center of Strategy Investigations of Eco-Bio-Technical Systems, Lviv, 1999, 133 p. (in Ukrainian).
- [3] Siforov V.I., Chistiakov N.I., Plonskiy A.F. Your science - radioelectronics, Znaniye, Moscow, 1974, 190 p. (in Russian).
- [4] Andrade e Silva J., Loshak J. Fields, particles, quants, Nauka, Moscow, 1972, 190 p. (in Russian).
- [5] Pauli W. Relativity theory, State Public House of Theor. and techn. lit., Moscow-Leningrad, 1947, 300 p. (in Russian)
- [6] Tiapkin A.A., Shibanov A.S. Poincaré?, Molodaya Gvardiya, Moscow, 1982 (in Russian).
- [7] Logunov A.A. On the works of Henri Poincaré? "About dynamics of electron", publ. house of Moscow university. 1988, 103 p. (in Russian).
- [8] Bolotovskiy B.M. Oliver Heaviside: the thoughts of physicist and calculations of mathematician, in Chislo i mysl', vyp. 6, Znaniye, Moscow, 1983, p. 126-172 (in Russian).
- [9] Brillouin L. The new view on relativity theory, Mir, Moscow, 1972, 144 p. (in Russian)
- [10] Terletskiy Ya.P. Paradoxies of relativity theory, Nauka, Moscow, 1966, 120 p. (in Russian).