CONSORTIUM

Editorial

INTERRELATION OF EXPERIMENT AND THEORY

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History:
Received: December 13, 2017
Accepted: December 19, 2017
First Published: December 27, 2017
Collection year: 2017
Confirmation of publication: Published

Identifiers and Pagination:
Year: 2017
Volume: 2
First Page: 4
Last Page: 5
Publisher ID: 10.21065/2520-5994.2.4
DOI:http://dx.doi.org/10.21065/2520-5994.2.4

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Citation:
Vasiliy Karlovich Balkhanov. Interrelation of experiment and theory. J Exp Phy, Vol 2. 2017. *p* 4-5

Funding:
The authors received no direct funding for this research.

Competing Interests:
The authors declare no competing interests

Additional information is available at the end of the article.

I'll start with the most important. My wish experimenters. In his statement in detail describe the conditions of the experiment. When negligent description of the experiment created by theory is often incorrect. If, in the course of the experiment, something went wrong, please note, can you stand at the threshold of the opening! History knows many such cases. For example, the opening of the induction of electric currents, or the discovery of X-rays by Röntgen. There are a great many such stories.

It is well known that the experiment will always say yes or no. Theory only will say "maybe." Experiment always requires time and investment. Enough theory to simply lie back on the couch. For the experiment often requires sophisticated ingenuity. The theory relies on the same fundamental laws, for example, the theory of relativity or quantum mechanics. However, the direct applicability of fundamental laws is often impossible due to the mathematical difficulties. Me in my scientific activity, to describe the results of measurements be used various ways to address emerging challenges. Briefly describe some of them.

Method 1 - decomposition of thermodynamic functions in a number of small parameter. In connection with the discovery of the Lake Baikal ice giant rings. I have developed the theory of education of a giant rotating convection column of water in the form of the toroidal core of education. This rotation allows you to convey to the upper layers of water heat from bottom source of heat, which causes convective rotation [DOI: 10.1134/S1063784213110054]. Ice begins to slightly melt. This leads to a decrease in ice thickness, which is noticeable from the near-Earth orbits as a giant rings. Here arose the task of heat distribution in the thickness of ice. For this task I spread in several thickness and minimized its free energy. In doing so, it turned out that the resulting. Act of thinning ice is already known, and is called the law of Stephen - growth or thinning of ice depends on the square root of time.

Method 2 – attracting large-scale invariance. When electromagnetic waves propagation in inhomogeneous many values are dependent on medium apart sedate way. For a description of the power patterns there are two methods. The first one is percolation, when you enter the set power indicators. The second method -theoretic-field, which lets you set the power scorecard to reduce to two arbitrary. However, B. Mandelbrot coined the generic power indicator - fractal dimension. This means that to describe the scale-invariant processes the remaining two arbitrary power indicator must be expressed through one fractal dimensionality. To solve this problem I've scaled them spatial coordinate and time. In doing so, had to introduce special power indicator, which is called the dimension of wandering. This indicator describes the wanderings of electromagnetic waves in inhomogeneous medium. Left to express the dimension of wandering through fractal dimension structure of heterogeneous medium. That for electromagnetic processes the product dimension of wandering and fractal dimension of strictly equal to 1.

Applying the developed an extensive theory to the equations of Maxwell, managed to describe the huge experimental material. All these results in addition to journal articles collected in my book [http://ipms.bscnet.ru/publications/src/2013/FractGeomet.pdf], that, unfortunately, available only in Russian.

Method 3 – guessing the functional regularities directly from experimental results. As is well known, from astronomical observations for the lensing effect fluctuations of the CMB and the accelerated

expansion of the universe were discovered dark matter and dark energy. In addition, starting from 30 years of the last century, since Zwicky, it was found that the rotation of galaxies is not subject to the law of Kepler - square radius of orbit is proportional to the cube of the rotation period. It turns out that the central part of the galaxies rotating as a solid body rotation speed is directly proportional to the distance from the center of the Galaxy. Further, according to the law of Kepler, rotational speed must decrease with distance from the Center. However from observation it was determined that the rotational speed remains almost constant, experiencing small fluctuations. To describe a new pattern, size dimension weight painted in three parts. The first one is normal weight, the second term describes the dark matter. The third term, directly proportional to the distance from the center of the Galaxy, called dark energy. Just a suggestion that dark energy is directly proportional to the distance from the center of the Galaxy and allows you to describe the observed rotation of galaxies.

The methods discussed show that researchers need a thorough description of the experiment. Only in this case it is possible to create a good theory.

As you know, the purpose of the research work is obtaining new knowledge. Only in this case you may receive investment, production, and create new devices, to facilitate our lives. This is the most noble goal of work - facilitating the lives of millions of people and their communication with each other.