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METHODOLOGICAL SIGNIFICANCE OF THE PRINCIPLES OF "SYMMETRY AND DISSYMMETRY" IN THE SYSTEM OF PHYSICAL KNOWLEDGE

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Abstract:
This article analyzes the methodological significance of the principles of symmetry and dissymmetry, which are its violations, in the system of physical knowledge. Based on these principles, epistemological possibilities of achieving new physical knowledge are revealed from the perspective of theories of fundamental interactions. It is based on the fact that in the system of physical knowledge, the idea of calibrating symmetry and its violation, as well as the idea of compensating for this violation, have important heuristic potential.

Keywords: symmetry, symmetry breaking, dissymmetry, Crystallography, group theory, fundamental interactions, quantum physics, conservation and change, gauge symmetry, spontaneous symmetry breaking.

Introduction

In the system of knowledge related to each discipline, there will be principles that have universal significance and can manifest the character of universality in themselves. The principles of symmetry and its violation (dissymmetry) are laws that have such status in physics.

Ideas about symmetry and its violation, although going back to a long history, became the main metatamoils in physics only by the 19th century. I.Gissel (France), A.Schonflis (Germany), A.V.Godolin and E.S.Scientists such as Fedorov (Russia) created the theoretical basis of Crystallography precisely on the idea of symmetry. According to him, it turns out that in nature there are no more than 230 symmetri gruppas of the structure of crystals. Later, the German mathematician E.Nieter related the conservation of moment of energy, momentum, amount of motion to the symmetry of space and time – the fundamental physical quantities being calculated. According to him, knowing the relationship between symmetry and the conservation of certain physical magnitudes, one can know the conservation laws for the sitema and vice versa the characteristics of the symmetry composition of the sitema using conservation laws. Nieter himself first determined the homogeneity of time, isotropy of space, and homogeneity of space, respectively, from the conservation laws of moments of energy, momentum, amount of motion.

Symmetry establishes not only the basis of scientific knowledge, but also the spatial and temporal relevance of movement, which is the main attribute of matter, describing the interrelationship of theory and cones, concepts, between and within systems. Symmetry represents the material structure of the universe and its composition. In gnoseological terms, however, visions of symmetry in elementary particle physics have given rise to a new view of the theory of interactions between them, making it possible to predict a number of new particles through the idea of the existence of different laws of conservation.

In general, symmetry has a meaning that expresses the unity of conservation and change. In the changes that are taking place in all the fronts of research, Special magnitudes are being determined that do not change. This is a symmetry of general content. As a result of applying the categories of preservation and

change from a philosophical-methodological point of view to physical processes, the following important conclusion is reached mumikin: “events and processes in nature occur in the manner of preserved changes and changed preservation”.

An example of the existing types of symmetry in physics is the dependence of the work performed at load on the height of the lift. The energy expended in this will depend on the differences in heights and will not depend on the shape and character of the road trajectory. The difference in available Heights is significant, and it does not matter at all from which point we began the trajectory of measurements. It can be said that the symmetry here will depend on our choice of the number head. To such a conservative system, we can also example the calculation of the work performed or the energy spent to move the charge in an electric field. Here, as an anomaly of height, the field may be stressed or have an electric potential. The energy spent in moving the charge will depend on the difference in potentials at the initial and final nodes in the field space. Here we use elements of calibration or scale symmetry. Calibrated symmetry leads to the Conservation Law of electric charge when viewed in an electric field. Calibration symmetry will also be able to solve many difficulties in elementary particle theory, as well as facilitate many attempts to combine different interactions. Interactions and the difficulties that arise when creating their general theorist - are solved by finding a hidden(new) type of symmetry. Because, in addition to the general symmetry, the microolam also contains private symmetries corresponding to each interaction.

In the late 1960s, S.Weinberg and Sadam proposed a theoretical combination of electromagnetic and weak interactions, using the connection between the idea of calibration symmetry and the concept of a calibration field. Studies have shown that the symmetry of weak interactions has turned out to be complex with respect to electromagnetic interactions. The reason for the complexity was based on the complexity of the process or the mechanism of weak interactions. In weak interactions, neutron absorption occurs. Neutron, proton, electron and neutrino may be involved in this process. As a result, the interconversion of particles occurs through weak interactions.

In the field of weak interactions, three new fields of forces have to be introduced during judgments for calibration symmetry. In quantum representation of the fields being introduced, the need for new particles carrying interactions is allowed. The presence of a W (positive-plus) particle, a W (negative-minus) particle, A Z (neutral) particle, originally predicted theoretically, later found in experiments, is taken as a necessity. Despite the fact that it is difficult to capture a calibrated area, in its nature the area affected by the extra time has become unstable. In this, the carriers of interaction will not have a mass at peace. But, it turned out that W and Z have a large mass compared to the mass of an electron. In this case, the calibrated symmetry is broken. Weinberg and Salam explained such a violation of symmetry based on the difference in electromagnetic and weak interactions, that small interactions are so small than electromagnetic interactions-that the reason for this is that W and Zs have a large mass.

In the process of knowledge from the point of view of methodological analysis, calibrated symmetry and its violation give us the impetus to look for aspects of symmetry that are unknown to us. Usually in the physics literature, these aspects are explained in the rakursi "spontaneous symmetry breaking". Hence, "spontaneous symmetry breaking" is an allusion to Seeking symmetry of an even higher order, which solves all the treatment of modern physics in the range from elementary particles - to cosmological problems.

In conclusion, it can be said that in the system of physical knowledge, the principles of "symmetry and dissymmetry" are important and determine the methodological basis of physical knowledge of the universe, as well as the heuristic potential.

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