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Remarks on uncertainties relations in quantum physics and beyond it

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It is generally accepted that uncertainties relation (URs) are a characteristic feature of quantum mechanics. In this case, the most known UR is the Heisenberg relation. The meaning of this inequality is usually associated with the accuracy limit of one-time experimental determination of a pair of quantum observables. The right-hand side of this relation contains the reduced Planck constant, the physical meaning of which goes back to the fundamental characteristic of the stochastic effect from the cold vacuum at $T=0.0$. Random values of observables arise not as a result of measuring procedures. Their origin is a natural reason in the form of a stochastic uncontrollable vacuum effect. UR is evidence of the correlation between fluctuations. This fact is fundamental, because allows us to assume that the phenomenon of fluctuations correlation and adequate UR may exist in the region of thermal phenomena for $T>0$. Confirmations of this can be found in Einstein's theory of fluctuations, where he actually obtained an expression of the type UR, in the right part of which the fundamental Boltzmann constant of thermal effect is. Conjugate characteristics in UR are treated as complementary quantities. Later the complementary principle of N Bohr, testifying to the incorrectness of the use of classical ideas, received a general philosophical interpretation. However the principle of complementarity considers the relationship between entities only at a qualitative level and does not envision quantitative assessments i.e. operates not with fluctuations, but with concepts, the nature of correlation is not defined by fundamental constants.

Biography

O N Golubjeva is a graduate of the Physics Department of the Moscow State University named after Lomonosov. Her field of interest is Theoretical Physics, history and philosophy of Physics. She is the author of more than 200 scientific papers published in Russia and abroad. At present she is a Full Professor, Chair of Gravity and Cosmology Department, Head of the interdisciplinary natural science education sector of Peoples' Friendship University of Russia, the author of the original course "Concepts of Modern Natural Science" for students.

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