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VARIATIONS ON QUANTUM THEORY

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Here I present my book. It is addressed to everybody who is interested in the quantum theory ground problems. It contains an endeavour to make a step from the simple declarations (like N. Bohr “correspondence principle”) to some plain and profound real correspondences between the quantum theory and the classic one. The bridges between them can be build!

The first chapter of the book remembers to a reader the most misterious aspects of the quantum theory. I shortly discuss the starting Heisenberg’s and Dirac’s ideas, the principle of uncertainty, the wave-particle dualism, the principle of superposition, the non-locality, the spin, and the particles identity problem.

The second chapter is called “By grieving about classic…”. This is the name of the famous Russian author Timur Shaov’s song, and it describes as well the situation relative to the modern musical children education as this one relative to the quantum mechanics methods. Really, Einstein, Schrodinger and many other physicists could not accept a mathematical and physical “exotic” that came in physics together with quanta. I analyze the Heisenberg’s complex variables presentation and compare it with the known one of the theoretical electrotechnics and the mechanics. I find out that these presentations are similar one to another. In paricular, the commutators can be also introduced for the electrical and mechanical classical oscillators. These classical commutators present practically the Poisson brackets and satisfy to the usual quatum form, but at the right side they contain the action value for the concrete oscillator, not the Planck constant. When we consider two-dimensional ocillators, two types of commutation appear like the commutators for bozons and fermions. I consider also some another aspects of the quantum – classic analogy. I show, there is very much of common details in the both quamtum and classical theories.

In the third chapter I treat a non-locality problem. As I noted above, at the “classical” commutators right side we have their “personal” action values. So, the question appears: why only the universal Planck constant presents always in the quantum commutators? The answer that I propose is such: because for all quantum commutators the action is the same one, it is proportional to the size of the (finite) Univrse. So, all the quantum commutators just occupy all the Universe and are non-local; also, the Planck “constant” is not constant and increases together with the Universe expanding. In this chapter I reproduce the Aspect’s experiments description and discuss the Bell’s theorem and the causes of the quantum mechanics to be non-local.

The fourth chapter is dedicated to the quantum measurement problem and to the superposition princiole. I discuss the modern decoherence theory and its connection with the irreversibility problem. Further, I criticize the fon Neumann measurement model, and I show that his “psichological parallelism” principle can be eliminated, and a human consciousness should be replaced by any irrevercible recorder existence. Finally, I consider the wave

function collapse problem, and I propose a new (dynamic) interpretation of the superposition principle, that should replace the Everett multiwords picture.

In the last (fifth) chapter I consider the particles identity problem. The classical statistical paradoxes are remembered and discussed, the connections between the commutation rules and a statistics type are described. The continuous transition to the complete identity (as it was proposed by another authors) is supported, and an additional model of it is proposed. Finally, I discuss a remarkable similarity between the elementary particles and the black holes.

I thank all the readers. Each of them may send me some questions and remarks using my e-mail addresse: shulman@dol.ru

Author, January of 2007

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