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The difficulties of quantum mechanics and necessity building nonlinear theory

Pang Xiao Feng
University of Electronic Science and Technology, China

The difficulties and contradictions of quantum mechanics, which is the foundations of model science, are exhibited and elucidated in detail and systematically through the comparisons between the experimental facts and theoretical results obtained from the solutions obtained from the basic dynamic equation or Schrödinger equation of microscopic particles in the different cases in quantum mechanics. We found from these results that the solutions of Schrödinger equation in different cases have only a wave property, cannot obtain the so wave-corpuscle duality no matter what forms of the external potential function. This means that Schrödinger equation can give only the wave feature, cannot always exhibit the wave-corpuscle duality of microscopic particles. Thus we can confirm that quantum mechanics is only a wave and linear theory, cannot describe really and correctly the properties of microscopic particles because these results are always contradict with the experimental results and facts. These facts are just the maximal difficulties of quantum mechanics. Why are these? From our deeply investigations we found that quantum mechanics exists many contradictions and difficulties. These difficulties and contradictions cannot absolutely be eliminated and overcome in its framework, no matter what methods we used. This manifest clearly that these difficulties and contradictions are inherent, essential and intrinsic in quantum mechanics. This means that it is very necessary and worth to study deeply their reasons and to change this theory. We discovered from its dynamic equation and Hamiltonian that the properties of microscopic particles are mainly affirmed by the kinetic energy term, the potential term can only vary their states. Therefore, dynamic equation has only one wave solution, not the corpuscle feature. This implies that the quantum mechanics must be changed and developed forward. However, how be changed the quantum mechanics? We think from the deeply investigations that the nonlinear interactions, such as $b|\phi|^2\phi$ should be added in the above Schrödinger equation, at the same time, corresponding nonlinear interaction term $b|\phi|^2\phi$ should also added into the Hamiltonian function of the systems. In this case the microscopic particles described by the nonlinear Schrödinger equation are a soliton, which has the wave-corpuscle duality; These features of microscopic particles are completely consistent with the experimental results. Thus the difficulties and contradictions existed in original quantum mechanics are eliminated completely. This manifested clearly that the variations and revision of quantum mechanics are correct. On the basis of these results we established the nonlinear quantum mechanics, which promotes the development of quantum mechanics. In this new theory the states and properties of microscopic particles are still represented by a wave function, but it satiates now the nonlinear Schrödinger equation. Based on these results we build and construct a perfect theory of nonlinear quantum mechanics, its maximum effort and success is to give a beautifully and completely wave-corpuscle duality. Thus it promote and excite the development of quantum mechanics.

However, a key problem occur in this case, i.e., does the nonlinear interaction exist really in physical systems? This is very worth to study further. Our researches verified and affirm that the nonlinear interactions are wide and really existent in all physical and biophysical systems, they are formed and produced by way of the interactions between the microscopic particles and framework field or among the particles through following five mechanisms of self-trapping, self-interaction, self-focus, self-condensation and self- location between the interactions between the microscopic particles and framework fields, such as

the ground fields or crystal lattice in solids and among the particles. Therefore, the nonlinear interactions are existed widely and common in physical systems. Therefore we can that nonlinear quantum mechanics can be applied in all physical systems to investigate the properties of movement of microscopic particle. Then we can conclude that the nonlinear quantum mechanics is correct and complete, it is the necessary result of development of quantum mechanics, and it is also a correct and real new theory of quantum mechanics.

Biography

Pang Xiao Feng is a professor in Physic-Biophysic, Doctorate Adviser and National excellent expert of science and technology of China. He has published about 413 articles and 5 books.

pangxf2006@aliyun.com