World Academy of Science, Engineering and Technology
International Journal of Physical and Mathematical Sciences
Vol:17, No:01, 2023

Quantum Mechanics as A Limiting Case of Relativistic Mechanics

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Abstract : The idea of unifying quantum mechanics with general relativity is still a dream for many researchers, as physics has only two paths, no more. Einstein's path, which is mainly based on particle mechanics, and the path of Paul Dirac and others, which is based on wave mechanics, the incompatibility of the two approaches is due to the radical difference in the initial assumptions and the mathematical nature of each approach. Logical thinking in modern physics leads us to two problems: - In quantum mechanics, despite its success, the problem of measurement and the problem of wave function interpretation is still obscure. - In special relativity, despite the success of the equivalence of rest-mass and energy, but at the speed of light, the fact that the energy becomes infinite is contrary to logic because the speed of light is not infinite, and the mass of the particle is not infinite too. These contradictions arise from the overlap of relativistic and quantum mechanics in the neighborhood of the speed of light, and in order to solve these problems, one must understand well how to move from relativistic mechanics to quantum mechanics, or rather, to unify them in a way different from Dirac's method, in order to go along with God or Nature, since, as Einstein said, "God doesn't play dice." From De Broglie's hypothesis about wave-particle duality, Léon Brillouin's definition of the new proper time was deduced, and thus the quantum Lorentz factor was obtained. Finally, using the Euler-Lagrange equation, we come up with new equations in quantum mechanics. In this paper, the two problems in modern physics mentioned above are solved; it can be said that this new approach to quantum mechanics will enable us to unify it with general relativity quite simply. If the experiments prove the validity of the results of this research, we will be able in the future to transport the matter at speed close to the speed of light. Finally, this research yielded three important results: 1- Lorentz quantum factor. 2- Planck energy is a limited case of Einstein energy. 3- Real quantum mechanics, in which new equations for quantum mechanics match and exceed Dirac's equations, these equations have been reached in a completely different way from Dirac's method. These equations show that quantum mechanics is a limited case of relativistic mechanics. At the Solvay Conference in 1927, the debate about quantum mechanics between Bohr, Einstein, and others reached its climax, while Bohr suggested that if particles are not observed, they are in a probabilistic state, then Einstein said his famous claim ("God does not play dice"). Thus, Einstein was right, especially when he didn't accept the principle of indeterminacy in quantum theory, although experiments support quantum mechanics. However, the results of our research indicate that God really does not play dice; when the electron disappears, it turns into amicable particles or an elastic medium, according to the above obvious equations. Likewise, Bohr was right also, when he indicated that there must be a science like quantum mechanics to monitor and study the motion of subatomic particles, but the picture in front of him was blurry and not clear, so he resorted to the probabilistic interpretation.

Keywords : lorentz quantum factor, new, planck’s energy as a limiting case of einstein’s energy, real quantum mechanics, new equations for quantum mechanics
Conference Title : ICQTR 2023 : International Conference on Quantum Theory and Relativity
Conference Location : Dubai, United Arab Emirates
Conference Dates : January 30-31, 2023