

Does the “Complex” Wave Function in Quantum Mechanics Represent Anything “Real” at all?

NATARAJAN T.S*

Department of Physics, Indian Institute of Technology, Tirupati,
Andhra Pradesh, 517 501, INDIA

*For correspondence: tsniit@iittp.ac.in

Highlights:

- A new interpretation of the role of the constant ‘c’ the velocity of light is proposed consistent with Einstein-Lorentz invariance condition and Dirac’s relativistic electron.
- A new internal motion proposed consistent with “zitterbewegung” motion which is ignored at present.
- Fundamental particles such as electrons travel along helical trajectory consistent with “zitterbewegung” motion and its representation naturally leads to the “complex” wave-function away from the controversial Copenhagen Interpretation.
- Clear understanding of the meaning of equations such as $\mathbf{p} = \hbar \cdot \mathbf{k}$ and $E = \hbar \omega$ as a consequence of internal motion postulated and resulting 3 dimensional helical wave.
- Amazing “grand unification” of special relativity and quantum mechanics achieved simply by understanding the crucial role the constant ‘c’ plays in the foundations!
- New interpretation of “proper time” and mass increase with velocity as a consequence of conservation of angular momentum of internal motion postulated.
- A new derivation of energy *eigen* values and wave-function for a particle trapped in an infinite potential-well as a consequence of quantization of geodesic world lines of helical paths.