

Abstract Submitted
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A proposed physical analog for a quantum probability amplitude

JEFFREY BOYD, retired — What is the physical analog of a probability amplitude? All quantum mathematics, including quantum information, is built on amplitudes. Every other science uses probabilities; QM alone uses their square root. Why? This question has been asked for a century, but no one previously has proposed an answer. We will present cylindrical helices moving toward a particle source, which particles follow backwards. Consider Feynmans book QED. He speaks of amplitudes moving through space like the hand of a spinning clock. His hand is a complex vector. It traces a cylindrical helix in Cartesian space. The Theory of Elementary Waves changes direction so Feynmans clock faces move toward the particle source. Particles follow amplitudes (quantum waves) backwards. This contradicts wave particle duality. We will present empirical evidence that wave particle duality is wrong about the direction of particles versus waves. This involves a paradigm shift; which are always controversial. We believe that our model is the ONLY proposal ever made for the physical foundations of probability amplitudes. We will show that our probability amplitudes in physical nature form a Hilbert vector space with adjoints, an inner product and support both linear algebra and Dirac notation.

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