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What is a probability amplitude in the real physical world? JEFFREY BOYD, Retired — What is a probability amplitude? All quantum mathematics (QM) is built on such amplitudes. Every other science uses probabilities; QM alone uses the square root of probabilities. Why? According to our model an amplitude is a real physical object. It has the shape of a cylindrical helix which particles follow backwards. This idea is found in Feynmans book QED. He speaks of amplitudes moving through space like the hands of a rapidly spinning clock. Particles follow such amplitudes with the probability of the square of the clocks hand (a complex vector). Such a hand traces a cylindrical helix. It conveys no energy. Feynman was mystified about what such amplitudes are in the physical world. But they are CENTRAL to his thinking. Feynman assumes that the clock faces travel in the same direction as particles. But empirical evidence suggests they travel in the opposite direction: particles follow amplitudes backwards. The Theory of Elementary Waves (TEW) is built on the idea that amplitudes and particles travel in opposite directions. If you review all wave particle duality experiments from this viewpoint, none of them contradict this. Other experiments can only be explained if amplitudes move in opposite direction as particles.

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