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On Perfect Mirror and the Existence of Particle-less Waves

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Abstract

A perfect mirror is a beam splitter that reflects a particle and transmits a fraction of its wave energy, resulting in a particle-less wave, accounting for dark energy and dark matter (as standing waves). Waves are periodic, residing in a quotient space as in clock times, in contrast to linear calendar times for particle motions. That is, we live in a diagonal 4-manifold, locally Euclidean. Dirac took the square-roots of the shell equation to account for particle/antiparticle, but in the 4 x 4 matrix form his equation does not square to the shell equation. Thus, we instead take the complex conjugates of the shell equation to arrive at particle/antiparticle, manifested as +/- sigma z of the Pauli matrices exhibiting opposite angular momenta, specifically, a left-handed positron changeable to a right-handed electron by a 180-degree rotation. The quotient space of waves renders action-at-a-distance for gravity and electromagnetism; in particular, the fine-structure-constant is dimensionless and leads to quantum entanglement with instant actions across spacetime. As a distinction, gravitational waves are caused by exogenous events and hence travel at the speed of light, which is analogous to an uplifting elevator with its clock running increasingly faster by General Relativity, causing variations in the spacetime curvatures.