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News & Comments

Tachyon Behaviour at Scattering Vertices Due to Mass-State Transitions

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The parametrized relativistic quantum theory (pRQT), a demonstrably covariant quantum theory with an invariant evolution parameter, may be tested using mass state transitions at scattering vertices. When a system with discrete mass states interacts with a parameter-dependent perturbation, transitions from one mass state to another are triggered in pRQT. This is comparable to the change from one energy state to another that occurs in Schroedinger quantum mechanics when a system with discrete energy states interacts with a time-dependent disturbance. pRQT's tachyon physics is distinct from that of other formulations. For instance, the common belief is that tachyons have fictitious mass. In contrast, tachyons in pRQT have actual mass, as seen below. Additionally, pRQT mass-state transitions offer a method for producing, destroying, or detecting tachyons. The goal of this work is to highlight instances of tachyon generation and annihilation that might make it easier to create pRQT experimental testing. In contrast to how mass is typically understood, the term of mass in pRQT has a different connotation. The traditional viewpoint holds that a particle's mass is a property that must be considered while performing computations. By first examining the definition of mass in pRCM, the distinction between the traditional understanding of mass and the pRQT view is made. When one has the relationship between the rest mass, m0, and the mass m of a classical particle travelling at speed v, classical special relativity does not allow subluminal particles to become superluminal particles and vice versa. As m is approached from above or below by v, infinity will be reached. Whether there is a method to get around the ban on infinite masses is still an open subject. Kinematic equations place restrictions on the permitted tachyon physical attributes in the simple particle beam-thin foil model under consideration. As a result, an experimental search needs to be extremely focused.

Think about particle studies where a projectile beam interacts with a thin foil as an illustration. Using the most recent information, calculations that demonstrate the production, destruction, and detection of tachyons using a stream of particles interacting with a thin foil are provided. He highlighted tachyon issues as having misconceptions and being complex, and authors clarified and evaluated them. For instance, the common belief is that tachyons have fictitious mass. Tachyons in the pRQT, in contrast, have actual mass. Additionally, pRQT mass-state transitions offer a method for producing, destroying, or detecting tachyons.

JOURNAL REFERENCE

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