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Superluminal Nature of Electroweak Radiation and Non Existence of Neutrinos

We propose a unified representation-theoretic reinterpretation of electroweak decay phenomenology based on tachyonic wavefunctions derived in a recent group theoretic extension of special relativity to include superluminal objects. The starting point is the extended space-time geometry in which the invariant content of a four vector is not Δs^2, but its modulus $|\Delta s^2|$. Correspondingly, the non-lightlike momentum invariant is $|p^\mu p_\mu| = M^2$, so that ordinary massive and tachyonic sectors (with invariants $p^\mu p_\mu = \pm M^2$ respectively) arise as different representatives of the same extended non-massless representation class. The central hypothesis of this paper is that direct products of electroweak decays are superluminal with respect to any laboratory reference frame and are described by tachyonic wavefunctions, that is, by $SO(2,1)$ unitary irreducible representations associated with spacelike momentum orbits. In order to reconstruct the amplitude of the tachyonic process as measured in the laboratory
reference frame we use equivalence between ordinary subluminal description obtained with wavefunctions coming from Unitary Irreducible Representations (UIRs) of $SO(3)$ (the representation space of the observables seen in the laboratory) and superluminal description obtained with UIRs of $SO(2,1)$ used to represent electroweak decay products wavefunctions. Each electroweak decay product $\mathcal{C}$ (electron, pion, muon, tau etc.) identifies the observables through which the measured decay process is reconstructed in the laboratory. These observables are mapped in the tachyonic representation space via conjugation with the unitary involution representing the intertwiner between massive and tachyonic representations in the non massless representation class of the extended group. The corresponding \(SO(2,1)\) amplitude contains a little-group factor and a spatial-translation phase. Its normalized phase admits a cumulant expansion
\begin{equation}
\log F_{\mathcal C,\mathbf n,g}(\tau)
=
-i\tau\kappa_1^{\mathcal C}
-\frac{\tau^2}{2}\kappa_2^{\mathcal C}
+\frac{i\tau^3}{6}\kappa_3^{\mathcal C}
+\cdots,
\qquad
\tau=\frac{c\Delta t}{\hbar}.
\end{equation}
The quantities usually attributed to neutrino physics are here reinterpreted as effective cumulant parameters of tachyonic electroweak amplitudes. Flavor labels ν_e, ν_μ, ν_τ are interpreted here not as labels of independent asymptotic particles, but as effective bookkeeping introduced when a tachyonic electroweak amplitude is reconstructed in the laboratory observables representation space; endpoint mass parameters arise from the first cumulant of the expansion; oscillation and short-baseline anomalies are associated with higher phase-curvature and dispersion cumulants; matter effects, CP-like phases, and sterile-neutrino parameters are interpreted as higher-order or medium-dependent corrections to the same tachyonic amplitude.
We use this mathematical structure to interpret the main classes of electroweak phenomenology: Wu-type parity-violating beta decay, KATRIN endpoint measurements,atmospheric and reactor anomalies, short-baseline anomalies, solar matter effects, OPERA-like timing anomalies, and high-energy cosmic neutrino events. The aim is to replace the various neutrinos labels and properties coming from energy lines obtained in spectra of

different experiments by a single geometric ansatz and its representation theoretic consequences: electroweak decay products are described by superluminal quantum states, and the observed electroweak phenomenology arises as the cumulant expansion of their $SO(2,1)$ probability amplitudes as reconstructed in the laboratory.

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