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Reexamining the CKM Angles of the Standard Model Through Non-Leptonic Neutral B Meson Decays in the Presence of Decoherence

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Quantum coherence plays a crucial role in the dynamics of neutral meson systems, aiding in the extraction of various Standard Model parameters. However, real physical systems inevitably interact with their environments, leading to decoherence effects. In the case of neutral B mesons, this decoherence is modeled using a single parameter, λ. It is important to reassess the Standard Model CKM angles (α, β, γ) and the mass difference (Δm) in the presence of decoherence. In this work, we propose an alternative method to extract these angles by analyzing time-dependent asymmetry in non-leptonic neutral B meson decays. Our findings indicate that the decoherence parameter λ influences and potentially obscures the extraction of Standard Model parameters.

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