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CP violation in hadronic tau decays (15' + 5')

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The decay $\tau \to 3\pi\nu_\tau$ shows no CP violation in the Standard Model. Therefore it serves as an excellent testing ground for New Physics effects. These effects in rate asymmetries depend on the interference of two helicity amplitudes of the axial vector current decaying to three pions. Motivated by the precise measurements from CLEO, BaBar and Belle, we present an analysis of these amplitudes with unprecedented precision that considers the rescattering between the final state pions. We show how unitarity and analyticity is preserved in our framework. Moreover, this analysis improves the description of the experimental data and is thus very interesting in view of the upcoming measurements at Belle II. The constraints from our results on New Physics models are discussed.

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