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Flavor SU(3) Analysis of D-meson Decays

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Abstract:

We carry out a systematic flavor $SU(3)$ analysis of D-meson decays including the leading order symmetry breaking effects. We find that $SU(3)$ breaking can easily account for the recent LHCb measurement of the difference in CP asymmetries in the decays of D^0 into K^+K^- and $\pi^+\pi^-$ mesons, once an enhancement mechanism, similar to the $\Delta = 1/2$ rule in neutral kaon decays is assumed. As a byproduct of the analysis, one can make predictions regarding the individual asymmetries in K^+K^-, $\pi^+\pi^-$, as well as the $D^0 \to \pi^0\pi^0$ decay channels. Moreover, we find that the asymmetry in the decay $D^+ \to \pi^+\pi^0$ vanishes in the leading approximation.

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