

Optimising sensitivity to γ with $B^0 \rightarrow DK^+\pi^-$, $D \rightarrow K^0 S \pi^+\pi^-$ double Dalitz plot analysis

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Two of the most powerful methods currently used to determine the angle γ of the CKM Unitarity Triangle exploit $B^+ \rightarrow DK^+$, $D \rightarrow K^0 S \pi^+\pi^-$ decays and $B^0 \rightarrow DK^+\pi^-$, $D \rightarrow K^+K^-$, $\pi^+\pi^-$ decays. It is possible to combine the strengths of both approaches in a “double Dalitz plot” analysis of $B^0 \rightarrow DK^+\pi^-$, $D \rightarrow K^0 S \pi^+\pi^-$ decays. The potential sensitivity of such an analysis is investigated in the light of recently published experimental information on the $B^0 \rightarrow DK^+\pi^-$ decay. The formalism is also expanded, compared to previous discussions in the literature, to allow $B^0 \rightarrow DK^+\pi^-$ with any subsequent D decay to be included.

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