

Time-Dependent Dalitz Plot Analysis of $B^0 \rightarrow K_S \pi^+ \pi^-$ Decays

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We perform a time-dependent Dalitz plot analysis of $B^0 \rightarrow K_S \pi^+ \pi^-$ in order to extract the CP violation parameters of $f_0(980)K_S$ and $\rho(770)K_S$ and direct CP-asymmetries of $K^+(892)\pi^-$. *The results are obtained from a data sample of $(383 \pm 3) \times 10^6$ $B\bar{B}$ decays, collected with the BABAR detector at the PEP-II asymmetric-energy B Factory at SLAC. The measured values of $2\beta_{\text{eff}}$ in B^0 decays to $f_0(980)K_S$ and $\rho(770)K_S$ are $(89 \pm 22 / -20 \pm 5 \pm 8)$ degrees and $(37 \pm 19 / -17 \pm 5 \pm 6)$ degrees, respectively, where the first quoted uncertainty is statistical, the second is systematic and the third is Dalitz plot signal model uncertainty. We measure the significance of $2\beta_{\text{eff}}(f_0(980)K_S) \neq 0$ to be 4.3 sigma.*

In decays to $K(892)\pi$ we find $\text{ACP} = -0.18 \pm 0.10 \pm 0.03 \pm 0.03$. The measured phase difference between the decay amplitudes of $B^0 \rightarrow K^+(892)\pi^-$ and $B^0 \rightarrow K^-(892)\pi^+$ is $(-164 \pm 24 \pm 12 \pm 15)$ degrees.

Talk, Poster, or Talk & Poster

Talk

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