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Charm decays at Belle

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Dalitz plot analysis of the decay $D^0 \rightarrow \pi^+ \pi^- \pi^0$

We report preliminary results of the Dalitz plot analysis of the decay $D^0 \rightarrow \pi^+\pi^-\pi^0$ using a 532 fb⁻¹ data sample collected with the Belle detector at the KEKB asymmetric-energy e^+e^- collider. The fit model includes the intermediate vector resonances $\rho(770)$, ω , $\rho(1450)$, and $\rho(1700)$, the scalar states $\sigma(600)$, $f_0(980)$, $f_0(1370)$, and $f_0(1500)$ as well as the tensor state $f_2(1270)$. The asymmetry between the two flavour samples - D^0 and \overline{D}^0 - has been also estimated.

Search for D^0 leptonic decays with Belle

We present a search for the rare D^0 leptonic decays, $D^0 \to e^+e^-$, $\mu^+\mu^-$, and the decays $D^0 \to e^+\mu^-$ which are forbidden in the Standard Model. Limits on the branching fractions for these decays are obtained using the well measured $D^0 \to \pi^+\pi^-$ decay channel for normalization. The search is performed using a large sample of D^0 decays recorded by the Belle experiment corresponding to an integrated luminosity of 660 fb⁻¹.

Study of $D^+_{(s)}$ decays to $K_S \pi^+$ and $K_S K^+$

Using 605 fb⁻¹ of data collected by the Belle detector at the KEKB asymmetric energy e^+e^- collider, we study the decays of $D^+_{(s)}$ mesons to $K_S\pi^+$ and K_SK^+ final states. We report branching fractions normalized with respect to Cabibbo-favored modes, $\Gamma(D^+ \to K_SK^+)/\Gamma(D^+ \to K_S\pi^+)$ and $\Gamma(D^+_s \to K_S\pi^+)/\Gamma(D^+_s \to K_SK^+)$.

Study of $\eta_c^{(\prime)}$ properties in $B \to \eta_c^{(\prime)} K$ decays

Reconstructed B decays to a charged kaon and an η_c -type charmonium from a data sample of 535 million $B\bar{B}$ meson pairs collected in the Belle experiment at the KEKB e^+e^- collider have been used to study properties of the η_c and its first excitation, the $\eta_c(2S)$. We use the decay mode $K_S K \pi$ to study the effects of interference between charmonium signal and B decays into the same final state without an intermediate charmonium. Taking this interference into account we obtain masses, widths, and decay branching fractions of the η_c and $\eta_c(2S)$ mesons. The results agree with the world average values; for the first time, interference effects are taken into account.

Measurement of the inclusive decay $D^0 \rightarrow \phi X$ and of exclusive decays of the D^0 particle involving a K^+K^- pair

Using data collected by the Belle detector at the KEKB storage ring and applying a novel method of completely reconstructing events up to a D^0 , with a K^+K^- pair "left over", the branching fraction of the inclusive decay of $D^0 \rightarrow \phi X$ has been measured with high precision. In addition, the exclusive branching fraction $D^0 \rightarrow K^+K^-$ has been determined with good precision. Furthermore various branching fractions of D^0 decays involving a K^+K^- pair have been measured for consistency: $D^0 \rightarrow (K^+K^-K^0)_{nonres}, \phi K^0, K^+K^-\pi^0, \phi (K^+K^-)\pi^0, and \text{phi}(K^+K^+)$ (onega[°]0. Results presented in the study are preliminary.

Observation of the doubly Cabibbo-suppressed decay $D_s + bK + K + pi$

We report the first observation of the doubly Cabibbo-suppressed decay $D + s \setminus toK + K + \langle pi - using 605 \text{ fb} \{-1\}$ of data collected with the Belle detector at the KEKB asymmetric-energy e + e - collider. The branching ratio with respect to its Cabibbo-favored counterpart $\langle mathcal \{B\}(D + s \setminus toK + K + \langle pi - \rangle / \langle mathcal \{B\}(D + s \setminus toK + K - \langle pi + \rangle)$ is $(0.229 \setminus pm0.028 \setminus pm0.012)$

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