

## **b -> s hadronic decays at Belle**

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Study of  $B^+ \rightarrow \rho^+ \omega$  decay at Belle

We report the results of a search for the charmless decay  $B^+ \rightarrow \rho^+ \omega$ . The analysis is based on a large data sample recorded at the  $\Upsilon(4S)$  resonance with the Belle detector at the KEKB asymmetric-energy  $e^+e^-$  collider.

Study of inclusive  $B \rightarrow X_s \eta$  at Belle

We report results on a search for inclusive high momentum  $\eta$  decays of the  $B$  meson using a large data sample accumulated at the  $\Upsilon(4S)$  resonance with the Belle detector at the KEKB asymmetric  $e^+e^-$  collider.

Measurements of  $B \rightarrow \phi \phi K$  Decays

We report improved measurements of the charmless decay  $B \rightarrow \phi \phi K$  using a  $605 \text{ fb}^{-1}$  data sample collected on the  $\Upsilon(4S)$  resonance with the Belle detector at the KEKB asymmetric energy  $e^+e^-$  collider. The results of the related charmonium decays such as  $B \rightarrow J/\psi K$  and  $J/\psi \rightarrow \phi \phi$  are also shown.

Measurements of Charmless Hadronic  $b \rightarrow s$  Penguin Decays in the  $\pi^+ \pi^- K^+ \pi^-$  Final State and Observation of  $B^0 \rightarrow \rho^0 K^+ \pi^-$

We report measurements of charmless hadronic  $B^0$  decays into the  $\pi^+ \pi^- K^+ \pi^-$  final state. The analysis uses a sample of  $657 \times 10^6$   $B\bar{B}$  pairs collected with the Belle detector at the KEKB asymmetric-energy  $e^+e^-$  collider at the  $Y(4S)$  resonance. The decay  $B^0 \rightarrow \rho^0 K^+ \pi^-$  is observed for the first time; the significance is  $5.0\sigma$  and the corresponding partial branching fraction for  $M_{K\pi} \in (0.75, 1.20) \text{ GeV}/c^2$  is  $[2.8 \pm 0.5(\text{stat}) \pm 0.5(\text{syst})] \times 10^{-6}$ . We also obtain the first evidence for  $B^0 \rightarrow f_0 K^+ \pi^-$  with  $3.5\sigma$  significance and for  $B^0 \rightarrow \pi^+ \pi^- K^{*0}$  with  $4.5\sigma$  significance. For the two-body decays  $B^0 \rightarrow \rho^0 K^{*0}$  and  $B^0 \rightarrow f_0 K^{*0}$ , the significances are  $2.7\sigma$  and  $2.5\sigma$ , respectively, and the upper limits on the branching fractions are  $3.4 \times 10^{-6}$  and  $2.2 \times 10^{-1}$  at 90% confidence level.

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