

Exclusive leptonic and radiative B meson decays at Belle

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Measurement of the Differential Branching Fraction and Forward-Backward Asymmetry for $B \rightarrow K^{(*)} \ell^+ \ell^-$

We study $B \rightarrow K^{(*)} \ell^+ \ell^-$ decays based on a data sample of 657 million $B\bar{B}$ pairs collected with the Belle detector at the KEKB e^+e^- collider. We report the differential branching fraction, isospin asymmetry, K^* polarization, and the forward-backward asymmetry (A_{FB}) as functions of $q^2 = M_{\ell\ell}^2 c^2$. The fitted A_{FB} spectrum tends to be higher than the Standard Model expectation in all q^2 bins. The measured branching fractions are $\mathcal{B}(B \rightarrow K^* \ell^+ \ell^-) = (10.7_{-1.0}^{+1.1} \pm 0.9) \times 10^{-7}$ and $\mathcal{B}(B \rightarrow K \ell^+ \ell^-) = (4.8_{-0.4}^{+0.5} \pm 0.3) \times 10^{-7}$, with the muon to electron ratios $R_{K^*} = 0.83 \pm 0.17 \pm 0.05$ and $R_K = 1.03 \pm 0.19 \pm 0.06$, respectively.

Search for purely leptonic decays $B^+ \rightarrow l^+ \nu$

The purely leptonic decay $B^+ \rightarrow l^+ \nu$ ($l = e, \mu$) is highly suppressed in the Standard Model due to lepton helicity mismatch but can be strongly enhanced in New Physics scenarios. We present a search for the decays $B^+ \rightarrow e^+ \nu$ and $B^+ \rightarrow \mu^+ \nu$ using a large data sample recorded by the Belle detector at the KEKB energy-asymmetric e^+e^- collider.

Evidence for $B \rightarrow K \eta' \gamma$

We report the results of a search for the radiative decay $B \rightarrow K \eta' \gamma$ and find evidence for $B^+ \rightarrow K^+ \eta' \gamma$. The results are obtained from a 605 fb^{-1} data sample collected at the $\Upsilon(4S)$ resonance with the Belle detector at the KEKB asymmetric-energy e^+e^- collider.

Measurements of time-dependent CP violation and branching fractions in radiative $B \rightarrow \phi K \gamma$ and $B \rightarrow \omega K \gamma$ decays

We report measurements of time-dependent CP -violation parameters in radiative $B^0 \rightarrow \phi K_S^0 \gamma$ and $B^0 \rightarrow \omega K_S^0 \gamma$ decays using a large data sample collected at the $\Upsilon(4S)$ resonance with the Belle detector at the KEKB energy-asymmetric e^+e^- collider. These measurements are sensitive to right-handed currents from new physics. We also report updated measurements of branching fractions in $B \rightarrow \phi K^+(K_S^0) \gamma$ decays and new measurements of $B \rightarrow \omega K^+(K_S^0) \gamma$ decays.

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