

Study of rare B decays at BABAR

We present results on radiative and electroweak-penguin decays based on the full BABAR dataset. The decays $B \rightarrow K^* l^+ l^-$ (both charged and neutral modes) are studied using an angular analysis to extract the quantities A_{FB} and F_L , which are sensitive to potential effects of physics beyond the Standard Model. Furthermore, the quantity P_2 , which is subject to smaller theoretical uncertainties and is more sensitive to non-SM contributions, is extracted.

We also present the first search for $B^+ \rightarrow K^+ \tau^+ \tau^-$, where one B meson from the decay of $Y(4S) \rightarrow B^+ B^-$ in a hadronic decay mode is fully reconstructed, and the topology of the rest of the event is compatible with a $B^+ \rightarrow K^+ \tau^+ \tau^-$ decay and leptonic decays of the tau leptons.

Finally, we report on measurement of the CP asymmetry in the radiative decay $B^0 \rightarrow K_S^0 \pi^- \pi^+ \gamma$, a quantity that is sensitive to possible processes where non-SM photon helicities are involved. The structure of the hadronic final state is studied using the isospin-related decay $B^+ \rightarrow K^+ \pi^- \pi^+ \gamma$. Along with the branching fractions of the charged and neutral decays, we present the CP asymmetry for events selected in the rho mass band, $S_{\{K_S^0 \pi^+ \pi^- \gamma\}}$, and finally extract the contribution from decay to the CP eigenstate, $B^0 \rightarrow K_S^0 \rho \gamma$.

Summary

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Session Classification: T1

Track Classification: Submissions