

Measurement of Branching Fractions of Singly Cabibbo-suppressed Decays $\Lambda_c^+ \rightarrow \Sigma^+ K_S^0$ and $\Sigma^0 K^+$

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Based on a sample of $4.4fb^{-1}$ of e^+e^- annihilation data collected in the energy region between 4.6 GeV and 4.7 GeV with the BESIII detector at BEPCII, two singly Cabibbo-suppressed decays $\Lambda_c^+ \rightarrow \Sigma^0 K^+$ and $\Lambda_c^+ \rightarrow \Sigma^+ K_S^0$ are studied. New determinations of the BFs of $\Lambda_c \rightarrow \Sigma K$ decays, in particular the mode and $\Lambda_c^+ \rightarrow \Sigma^+ K_S^0$, are important for validating and improving these theoretical-model calculations. Furthermore, improved measurements may clarify the tension between the predictions in different models. The branching fractions $\mathcal{B}(\Lambda_c^+ \rightarrow \Sigma^0 K^+)$ and $\mathcal{B}(\Lambda_c^+ \rightarrow \Sigma^+ K_S^0)$ are determined to be $(4.7 \pm 0.9(stat.) \pm 0.1(syst.) \pm 0.3(ref.)) \times 10^{-4}$ and $(4.8 \pm 1.4(stat.) \pm 0.2(syst.) \pm 0.3(ref.)) \times 10^{-4}$, respectively. The branching fraction of $\Lambda_c^+ \rightarrow \Sigma^+ K_S^0$ decay is measured for the first time. With the additional data which are foreseen to be collected near the Λ_c pair threshold in the coming years, we expect our measurements to improve in precision, and shed more light on the topic of charmed baryon decays.

Category

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