

High Energy Physics - Experiment

Observation of New Charmless Decays of Bottom Hadrons

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We search for new charmless decays of neutral b -hadrons to pairs of charged hadrons with the upgraded Collider Detector at the Fermilab Tevatron. Using a data sample corresponding to 1 fb^{-1} of integrated luminosity, we report the first observation of the $B_s K \pi$ decay, with a significance of 8.2σ , and measure $\text{BR}(B_s K \pi) = (5.0 \pm 0.7 \text{ stat} \pm 0.8 \text{ syst}) \times 10^{-6}$. We also report the first observation of charmless b -baryon decays in the channels $\Lambda_b p \pi$ and $\Lambda_b K$ with significances of 6.0σ and 11.5σ respectively, and we measure $\text{BR}(\Lambda_b p \pi) = (3.5 \pm 0.6 \text{ stat} \pm 0.9 \text{ syst}) \times 10^{-6}$ and $\text{BR}(\Lambda_b K) = (5.6 \pm 0.8 \text{ stat} \pm 1.5 \text{ syst}) \times 10^{-6}$. No evidence is found for the decays $B_d K K$ and $B_s p \pi \pi$, and we set an improved upper limit $\text{BR}(B_s p \pi \pi) < 1.2 \times 10^{-6}$ at the 90% confidence level. All quoted branching fractions are measured using $\text{BR}(B_d K \pi)$ as a reference.

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