

# Evidence for a bottom baryon resonance state $\Lambda_b^*$ with the CDF II detector

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Using data from proton-antiproton collisions at center of mass energy of 1.96 TeV recorded by the CDF II detector at the Fermilab Tevatron, evidence for the excited resonance state  $\Lambda_b^*$  is presented in its fully reconstructed decay mode to  $\Lambda_b^0 \pi^+ \pi^-$  where  $\Lambda_b^0$  decays to  $\Lambda_c^+ \pi^-$  with  $\Lambda_c^+$  decaying to  $p K^- \pi^+$ . The analysis is based on a data sample corresponding to an integrated luminosity of  $9.6 \text{ fb}^{-1}$  collected by an online event selection based on charged-particles' tracks displaced from the proton-antiproton interaction point. The significance of the observed signal is 3.5 sigma. The mass of the observed state is found to be  $5919.22 \pm 0.35 \text{ (stat)} \pm 0.30 \text{ (syst)} \pm 0.70 \text{ (PDG)} \text{ MeV}/c^2$  in agreement with similar findings in proton-proton collisions experiments.

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