

Measurement of Λ_b polarization and the angular parameters using the decay $\Lambda_b \rightarrow J/\psi + \Lambda^0$

Abstract

We present a measurement of the Λ_b polarization based on an angular analysis of the decay $\Lambda_b \rightarrow J/\psi\Lambda$, using data from pp collisions at $\sqrt{s} = 7$ TeV and 8 TeV collected with the CMS detector. A transverse Λ_b polarization of $0.00 \pm 0.06(\text{stat}) \pm 0.02(\text{syst})$. Our result for α_1 , the asymmetry parameter, is compatible with predictions that lie in the range 10% – 20%, but it does not agree with the prediction of HQET of 77% reported in the literature. The measured values for the helicity amplitudes are consistent with the values reported by LHCb and ATLAS. Accordingly, the Λ_b decay has suppressed positive-helicity states for Λ^0 corresponding to a total negative longitudinal polarization for Λ^0 .

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