

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

## Abstract

We present a measurement of the  $\Lambda_b$  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  $\Lambda_b$  polarization of  $0.00 \pm 0.06(\text{stat}) \pm 0.02(\text{syst})$ . Our result for  $\alpha_1$ , 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  $\Lambda_b$  decay has suppressed positive-helicity states for  $\Lambda^0$  corresponding to a total negative longitudinal polarization for  $\Lambda^0$ .

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