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Heavy flavour spectroscopy and production in the forward acceptance at the LHC

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The latest years have seen a resurrection of interest in searches for predicted and exotic states motivated by tantalising observations by Belle and CDF. Using the data collected at pp collisions at 7 and 8 TeV by the LHCb experiment. We present a study of the properties of the $Z(4430)^+$ resonance, with a first unambiguous determination of its quantum numbers. We also report on observations of excited states of the B, Bs and Λ_b hadrons and measurements of their masses and decay widths. Its forward acceptance puts the LHCb in a unique position at the LHC to measure QCD phenomena at large rapidities and low transverse momenta, where theoretical models often fail to describe the data accurately. We present studies of the production and polarisation of the J/ψ , $\psi(2S)$ and χ_c charmonium states as well as those of Υ and χ_b bottomonia.

Summary

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