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Results on production and decay of B hadrons and onia and X(5568) state search in CMS

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We present precise measurements of decay properties of hadrons containing a b quark performed on the data collected by the CMS experiment at LHC. The lifetime is among the fundamental properties of particles and in heavy hadrons it is one of the important observables that allows to test the theoretical tools describing their physics. Some of the reported measurements are at the precision level of the world average for these properties.

We report measurements of the differential cross sections and polarizations of B hadrons and quarkonium states. These are important tools to investigate heavy-quark production mechanisms in QCD. The dependences on transverse momentum, rapidity, and particle multiplicity are investigated. Comparisons with theory expectations and among different collision energies are provided.

The evidence for an unexpected narrow $B_s \pi$ structure claimed by the D0 Collaboration and named X(5568) has triggered its search in other hadron collider experiments including CMS. Its interest resides in its possible interpretation as an hadronic state composed of four different quark flavours (udsb). The CMS search is performed using an integrated luminosity of 19.7 fb^{-1} of pp collisions at $\sqrt{s}=8 \text{ TeV}$ and provides the current most stringent Upper Limits on the ratio of the production rates of X(5568) and B_s multiplied by the unknown branching fraction of the $B_s \pi$ decay, given in two different kinematic regions defined on the basis of the transverse momentum of the B_s . The obtained CMS upper Limits contradict the D0 measurement and are in agreement with the results by the LHCb Collaboration.

Experimental Collaboration

CMS

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