



Contribution ID: 252

Type: Oral presentation

Studies of heavy quark dynamics using B^+ , B_s^0 and B_c mesons with the CMS detector

Thursday, 7 April 2022 10:20 (20 minutes)

Heavy quarks are one of the most important probes to study the properties of quark-gluon plasma (QGP). Hadronization of beauty quarks is not as well understood as in the charm sector. Illuminating the hadronization mechanism is crucial for extracting the transport properties of the QGP. We present new results on nuclear modification factors of B_s^0 and B^+ mesons and their yield ratios in pp and PbPb collisions at 5.02 TeV, using data recorded with the CMS detector in 2017 and 2018. The reported B-meson nuclear modification factors over an extended transverse momentum range will provide important information about the diffusion of beauty quarks and the flavor dependence of in-medium energy loss. The B_s^0/B^+ yield ratio in pp and PbPb can shed new light on beauty hadronization mechanisms from small to large systems and on the relevance of parton recombination in the medium. We also report the first observation of the B_c meson in nucleus-nucleus collisions, through partial reconstruction of the semi-leptonic decay $B_{c^+} \rightarrow (J/\psi \rightarrow \mu^+\mu^-) \mu^+ \nu_\mu$. Given the low production cross-section in proton-proton collisions, its production could be dramatically enhanced by the combination of beauty quarks with the charm quarks present in the plasma, providing additional insights into the recombination mechanism. The B_c nuclear modification factors are compared with similar (CMS) measurements for other heavy-flavor mesons and quarkonia.

Primary author: CMS

Presenter: SHENG, Tzu-An (Massachusetts Inst. of Technology (US))

Session Classification: Parallel Session T11: Heavy flavors, quarkonia, and strangeness production

Track Classification: Heavy flavors, quarkonia, and strangeness production