

# Studies of heavy flavor dynamics using $B^+$ , $B_s^0$ and $B_c$ mesons with CMS

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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.

## Present via

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