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Studies of beauty hadronization and in-medium energy loss with B^+ and B_s spectra

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Beauty quark is one of the best probes of the Quark Gluon Plasma. Its large mass allows to probe the QGP transport properties in the heavy flavor sector through energy loss and diffusion. However, the hadronization of beauty is not as well understood as that of charm due to the smaller cross-section. Clarifying the hadronization mechanism is crucial for understanding the transport properties in QGP extracted from beauty hadron (and their decay product) spectra. In this talk, we will 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 the data recorded with the CMS detector in 2017 and 2018. The accuracy is significantly improved with respect to the previously published results. The reported B mesons nuclear modification factors over an extended transverse momentum range will provide important information about the diffusion of beauty quark 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 the mechanisms of beauty recombination in vacuum and in medium. It will also provide an important input to understand the hadronization mechanism of beauty quark, testing the QCD factorization theorem at the LHC energy.

In-person participation

Yes

Primary author: SHENG, Tzu-An (Massachusetts Institute of Technology)**Presenter:** SHENG, Tzu-An (Massachusetts Institute of Technology)**Session Classification:** Heavy Ions**Track Classification:** Heavy Ions