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PHENIX measurements of heavy flavor production and flow in Au+Au collisions

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Mass ordering is expected for energy loss of quarks traversing the quark gluon plasma (QGP). Gluon bremsstrahlung is the dominant mechanism for light quark energy loss; however, both radiative and collisional energy loss must be considered for heavy quarks. At low transverse momentum these mechanisms have significant quark mass dependence. Therefore, separated charm and beauty measurements are necessary to disentangle these effects. In addition, analysis of the azimuthal anisotropy in the production of heavy flavor particles and quarkonia may give insights in the interactions of the charm and beauty quarks with the medium, e.g. –if they equilibrate with the QGP or if they remain distinct from the bulk system.

PHENIX has lepton identification and silicon vertex detectors both in the central and forward/backward rapidity regions, which allow for displaced vertex analysis of the charm and bottom hadron decays, and the reconstruction of quarkonia. We will present measurements of the nuclear modification factors and elliptic flow of heavy flavor particles and the J/ψ mesons. These results will be put in the context of energy loss mechanisms and heavy flavor dynamics in the QGP.

On behalf of collaboration?

PHENIX

Attending in-person?

Yes

Subfield

Heavy-ion experiment

Preferred track

Hadronic Issues in Heavy-Flavour Physics

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Session Classification: Poster Session