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Heavy flavour production at STAR

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Heavy quarks are produced early in the heavy-ion collisions and they are expected to interact differently from light quarks with the Quark Gluon Plasma (QGP); therefore, they are unique probes of the QGP properties. Moreover, their production and elliptic flow are sensitive to the medium dynamics. These measurements for open heavy flavour sector are crucial for understanding the parton energy loss mechanism and the degree of thermalization of the QGP. They can be also used to determine the transport coefficients of the QGP. Furthermore, production of various quarkonia states can provide insight into thermodynamic properties of the QGP since different states are predicted to disassociate (due to the Debye screening of the quark-antiquark potential) at different temperatures.

In this talk, we report on recent STAR results on heavy flavour production at $\sqrt{s_{NN}} = 200, 62.4$ and 39 GeV. We present nuclear modification factor and elliptic flow of open charm mesons and electrons from semileptonic decays of heavy flavor hadrons. We also report on new measurement of energy dependence of the J/psi production. STAR data are compared to theoretical model calculations and physics implications are discussed.

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