

# Beam energy dependence of heavy flavor production in Au+Au collisions at STAR

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Heavy quarks are predominantly produced in the initial hard partonic scatterings, and carry information about the entire evolution of the Quark-Gluon Plasma (QGP) created in heavy-ion collisions. Quarkonia and electrons from heavy-flavor hadron decays (HFE) are employed as tools for investigating heavy-quark dynamics experimentally. The changes in the production rate of quarkonia in the QGP are indicative of the effects of both static and dynamic dissociation processes induced by the medium, as well as contributions from regeneration. On the other hand, the reduction in production rate and the directional asymmetry of HFE are linked to the heavy-quark energy loss and the level of thermalization in the QGP medium.

This talk presents new measurements of inclusive  $J/\psi$  production in Au+Au collisions at  $\sqrt{s_{NN}} = 14.6, 19.6$  and  $27$  GeV by using high-statistics datasets from Beam Energy Scan phase II with the STAR experiment. The  $J/\psi$  yields and nuclear modification factors ( $R_{AA}$ ) are presented as a function of transverse momentum, centrality and collision energy. Moreover, the HFE yields, central-to-peripheral nuclear modification factors ( $R_{CP}$ ) and elliptic flow ( $v_2$ ) measured in Au+Au collisions at  $\sqrt{s_{NN}} = 54.4$  GeV, are reported as a function of transverse momentum and centrality. These results are compared with theoretical model calculations and previous STAR measurements at higher energies.