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Charmonia production in heavy ion collisions

Tuesday, 18 July 2023 15:00 (20 minutes)

We study charmonia in heavy ion collisions by focusing on the production of charmonium states from charm and anti-charm quarks in a quark-gluon plasma by recombination. Starting from the investigation on the internal structure, or the wave function of charmonium states we discuss the yield and transverse momentum distributions of charmonium states produced in heavy ion collisions. We argue that the wave function distribution plays a significant role, especially, in the production of charmonium states, leading to the transverse momentum distribution of the $\psi(2S)$ meson as large as that of the J/ψ meson. We discuss further the anisotropic flow, or elliptic and triangular flow of charmonium states using the transverse momentum distribution of charmonium states. We find that the internal structure differences as well as feed-down contributions of charmonium states are averaged out for elliptic and triangular flow, resulting in similar elliptic and triangular flow for all charmonium states. Based on our evaluation of elliptic and triangular flow of charmonium states we also discuss the quark number scaling of elliptic and triangular flow for charmonium states in heavy ion collisions.

Consent

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