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## Performance study of non-prompt $J/\psi$ production in Pb–Pb collisions at $\sqrt{s_{\text{NN}}} = 5.36$ TeV from ALICE

Lattice QCD calculations predict that a strongly-coupled QCD matter, the quark-gluon plasma (QGP), can be formed in relativistic heavy-ion collisions at extremely high temperatures and energy densities. Due to their large masses, heavy quarks ( $c, b$ ) are predominantly produced in the initial hard scattering process before the hot QCD medium forms. Their final-state dynamics, therefore, encode information about the evolution of the system, making them effective probes to the properties of the hot QCD medium. Charmonia, bound states of a charm and an anti-charm quark, are of particular interest. In high-energy hadronic collisions, inclusive  $J/\psi$  production consists of both prompt and non-prompt components. The prompt component includes  $J/\psi$  produced directly or from the decays of higher-mass charmonium states (e.g.,  $\psi(2S)$  or  $\chi_c$ ), while the non-prompt component originates from the weak decays of bottom hadrons. Therefore, the study of the production and properties of non-prompt  $J/\psi$  would provide valuable insights into those of the beauty hadrons.

The Time Projection Chamber and Inner Tracking System of the ALICE detector were recently upgraded, allowing a  $\sim 50$  times increase in read-out rate in Run3 of the Large Hadron Collider (LHC). In this poster, we will study the separation capability of the prompt and non-prompt  $J/\psi$  components in the ALICE detector. The performance of the non-prompt  $J/\psi$  measurements in Pb–Pb collisions at  $\sqrt{s_{\text{NN}}}$  in ALICE during LHC Run3 will be presented.

### Category

Experiment

### Collaboration (if applicable)

ALICE Collaboration

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