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Prompt and non-prompt J/ψ separation performances at forward rapidity (2.5 < y < 3.6) in pp collisions

The ALICE experiment changed its data-taking strategy from triggered to continuous detector readout and underwent several detectors upgrades, in order to cope with the LHC Run3 luminosity increase and maximize the amount of data collected. Among the aforementioned upgrades, the installation of the new muon forward tracker (MFT) enriches the study of quarkonium production previously carried out with the ALICE muon spectrometer at forward rapidity (2.5 < y < 4). In particular, thanks to its high spatial resolution, the MFT allows to identify the quarkonia directly produced at the collision (prompt) from those coming from beauty hadron decays (non-prompt). This separation is critical to enlarge our knowledge of heavy-quark production both in pp and heavy-ion collisions, including access to charmonia decaying from b-hadrons and clearer analysis of the quarkonia regeneration mechanism. Experimentally, the prompt/non-prompt separation performance relies on highly efficient track matching between the MFT and the muon spectrometer, together with the precise determination of the secondary vertex. It can be performed using the pseudo-proper decay time τ at forward rapidity (2.5 < y < 3.6) along the beam axis. In this poster, prompt and non-prompt J/ψ separation performances and preliminary results of the prompt and non-prompt J/ψ fraction at forward rapidity (2.5 < y < 3.6) in pp collisions at $\sqrt{s} = 13.6$ TeV will be presented.

Category

Experiment

Collaboration (if applicable)

ALICE Collaboration

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