

Charmonium production at midrapidity using TRD-triggered data measured in ALICE

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Quarkonium production is considered one of the golden probes of quark-gluon plasma (QGP) formation in heavy-ion collisions. Quarkonium production in small collision systems is also important for investigating production mechanisms and providing a reference for heavy-ion collisions. Charmonium, a bound state of charm and anti-charm quark pairs, has its production mechanism described by perturbative QCD for heavy quark production and non-perturbative QCD calculations for the formation of the bound state. Measurements of J/ψ and $\psi(2S)$ cross sections in pp collisions are crucial for studying charmonium production mechanisms and testing different QCD-based model calculations. Especially, $\psi(2S)$ production relative to J/ψ provides strong discriminating power among quarkonium production models. Thanks to the ALICE online single-electron triggers from the Transition Radiation Detector (TRD), the $\psi(2S)$ signal can be extracted at midrapidity via the dielectron decay channel.

In this contribution, the results on p_T -differential $\psi(2S)$ production cross section at midrapidity with the TRD-triggered data measured in ALICE in pp collisions at $\sqrt{s} = 13$ TeV will be shown for the first time, along with those for J/ψ . In addition, the excited-to-ground state yield ratio ($\psi(2S)$ -to- J/ψ) at midrapidity will be discussed. Results will be compared to measurements at forward rapidity and available model calculations.

Category

Experiment

Collaboration

ALICE

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