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Recent quarkonium measurements in small systems with the ALICE detector at the LHC

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At the LHC energies Multiple Parton Interactions (MPI) are expected to affect not only processes involving soft particle production, but also the hard momentum scales relevant for the production of heavy quarks, such as charm and beauty. Quarkonium measurements in high-multiplicity proton-proton (pp) collisions can shed light on the role of MPI at such hard momentum scales, as well as on the interplay between hard and soft particle production mechanisms. In addition, quarkonium production measurements in minimum bias pp collisions, besides serving as a reference for heavy-ion collisions collected at the same center-of-mass energy, represent a benchmark test of QCD based models in both perturbative and non-perturbative regimes.

The ALICE detector has unique capabilities at the LHC for measuring quarkonia down to zero transverse momentum. Measurements are carried out at both central and forward rapidity, in the dielectron and dimuon decay channel, respectively.

In this contribution, the latest quarkonium measurements performed by the ALICE collaboration in pp collisions at several center-of-mass energies will be presented. Recent $\Upsilon(1S)$, $\Upsilon(2S)$ and $\Upsilon(3S)$ cross section measurements performed at $\sqrt{s} = 5$ TeV, down to zero transverse momentum and at forward rapidity, will be shown. A comprehensive study of the multiplicity dependence of the quarkonium production at $\sqrt{s} = 13$ TeV, based on minimum bias and high-multiplicity triggered events, will be also presented. Such measurements include $\psi(2S)$ production at forward rapidity as a function of the charged particle multiplicity density, as well as the latest multiplicity dependent inclusive J/ψ production measurements at mid-rapidity, based on multiplicity estimators covering different pseudorapidity regions. Similar multiplicity dependent measurements in p-Pb collisions at center-of-mass energies of $\sqrt{s_{NN}} = 5.02$ and 8.16 TeV will also be shown. Results will be compared with available theoretical model calculations.

Collaboration (if applicable)

ALICE

Track

Initial State

Contribution type

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