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Charmonium production in pPb and PbPb collisions at 5.02 TeV with CMS

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Charmonium states, such as the J/ψ and $\psi(2S)$ mesons, are excellent probes of the deconfined state of matter, the Quark-Gluon Plasma (QGP). The understanding of charmonia production in PbPb collisions requires the inclusion of many phenomena, such as dissociation in the QGP and statistical recombination, on top of cold nuclear matter effects (modifications of nPDFs, initial-state energy loss, nuclear break-up). Measurements of charmonia production in pPb collisions are crucial in order to disentangle the QGP-related effects from cold nuclear matter effects. In this talk, final results on the relative J/ψ and $\psi(2S)$ modification, based on the pp and PbPb data collected at $\sqrt{s_{NN}} = 5.02$ TeV by CMS in 2015, will be reported. In addition, new prompt and nonprompt J/ψ results in PbPb collisions at the same center-of-mass energy, including the nuclear modification factor R_{AA} , will be presented over a wide kinematic and centrality range ($3 < \sqrt{s_{NN}} < 50$ GeV/c, $|y| < 2.4$, and fine event-centrality intervals). The results are compared to those obtained at $\sqrt{s_{NN}} = 2.76$ TeV over a similar kinematic range. Also new prompt $\psi(2S)$ R_{AA} results at $\sqrt{s_{NN}} = 5.02$ TeV will be presented. Final prompt and nonprompt J/ψ results in pPb collisions at 5.02 TeV will also be discussed, using the 2015 pp data taken at the same energy. At last, final results will be reported regarding prompt $\psi(2S)$ meson production in pPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV, as a function of transverse momentum and rapidity and down to $p_{\perp} = 4$ GeV/c.

Experimental Collaboration

CMS

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