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Recent results of charmonium and bottomonia in pp, pPb, and PbPb collisions with the CMS detector

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We present the recent results of J/ψ -jet correlation and the cross-sections $Y(nS)$ states in heavy-ion collisions, using the data collected by the CMS experiment at $\sqrt{s_{NN}} = 5.02$ -TeV.

J/ψ production has long been known to be modified in heavy-ion collisions, via, among many, the Debye screening effect. Indirect evidence of, in particular, the non-vanishing v_2 of J/ψ at large transverse momentum, however, suggests that jet quenching may also play an important role in J/ψ suppression. We present the final results of reconstructed J/ψ -jets in heavy-ion collisions. We measure the jet fragmentation function of jets containing a J/ψ meson, to study the dependence of quenching effects on the degree of associated hadro-production inside the jet.

We also present the production cross-sections of $Y(1S)$, $Y(2S)$, and $Y(3S)$ states pPb collision, and their nuclear modification factors (R_{pPb}). The result shows that Y states are suppressed in pPb collision compared to pp collision, while less pronounced than it is in the lead-lead collision. Sequential ordering of the Y R_{pPb} , with $Y(1S)$ least suppressed and $Y(3S)$ most suppressed, indicates the final-state modification of Y states in pPb collisions. Predictions using the final-state comover interaction model, which incorporates sequential suppression of bottomonia in pPb collisions, are in better agreement with the measured R_{pPb} versus rapidity than predictions using initial-state modification models.

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