Contribution ID: **492** Type: **Oral**

Measurement of charmonium production at forward rapidity in Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV with ALICE.

Tuesday 7 February 2017 15:20 (20 minutes)

ALICE is the LHC experiment dedicated to the study of ultra relativistic heavy-ion collisions where the formation of a hot and dense strongly-interacting medium, a Quark-Gluon Plasma (QGP), is expected. Considerable theoretical and experimental efforts have been invested in the last 30 years to study the properties of the QGP. One of the signals of QGP formation is the charmonium suppression. Measurements from Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$ TeV revealed a suppression of charmonium yields in central collisions, compared to binary-scaled pp collisions. However, the magnitude of the suppression is smaller than what was observed at lower energies at the SPS and RHIC, indicating that J/ψ regeneration via recombination of charm and anti-charm quarks plays an important role at LHC energies.

In this contribution, charmonium ($\psi(2S)$ and J/ψ) measurements at forward rapidity ($2.5 < y < 4$) in Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV with ALICE will be presented.
The analyses are performed in the dimuon decay channel down to zero transverse momentum (p_T) with the data sample collected in 2015 (about 7 times more statistics than that collected in Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$ TeV). Together with results on the J/ψ nuclear modification factor $R_{\rm AA}$ as a function of centrality, transverse momentum and rapidity, new multi-differential measurements will be presented. First results on the J/ψ $\langle p_{\rm T}\rangle$ and $\langle p_{\rm T}^2\rangle$ as a function of centrality will be discussed. Preliminary results on the ($\psi(2S)$/J/ψ) ratio as a function of centrality and transverse momentum will also be shown. The results will be compared to various theoretical models as well as to other experimental results.

Preferred Track

Quarkonia

Collaboration

ALICE

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Session Classification: Parallel Session 3.3: Quarkonia (I)

Track Classification: Quarkonia