Contribution ID: **234** Type: **3a) Heavy-flavours and quarkonia (TALK)**

ALICE results on quarkonium production in p-Pb collisions

Tuesday 2 October 2018 15:40 (20 minutes)

The study of quarkonium in proton-nucleus collisions is an important tool to investigate how cold nuclear matter effects can influence the J/ψ, the ψ(2S) or the Υ production. Mechanisms as the modification of the parton distribution functions in nuclei, the presence of a color glass condensate or the coherent energy loss of the $Q\overline{Q}$ pair in the medium have been shown to be the relevant processes to describe the production of the most tightly bound states, as the J/ψ and the Υ(1S). On the contrary, final state mechanisms, possibly related to the presence of a dense medium, are required to explain the stronger suppression observed for the loosely bound ψ(2S) state.

ALICE has measured quarkonium production in p-Pb collisions over a wide kinematic range, covering the backward ($-4.46 < y_{\rm cms} < -2.96$), the mid ($-1.37 < y_{\rm cms} < 0.43$) and the forward ($2.03 < y_{\rm cms} < 3.53$) rapidity regions, down to zero transverse momentum.

Measurements of the nuclear modification factor ($R_{\rm pA}$) obtained at mid- rapidity in p-Pb collisions at $\sqrt{s_{\rm NN}}$=5.02 TeV and $\sqrt{s_{\rm NN}}$=8.16 TeV, for prompt and non-prompt J/ψ, will be presented. Results on the transverse momentum, rapidity and centrality dependence of the J/ψ and Υ(1S) $R_{\rm pA}$, measured at forward and backward rapidities at $\sqrt{s_{\rm NN}}$=8.16 TeV, will also be shown. Finally, the production of the ψ(2S) and Υ(2S) resonances in p-Pb collisions at √sNN=8.16 TeV, at forward and backward rapidities, will be discussed in comparison to the production of the most tightly charmonium and bottomonium states. All the results will also be compared to those obtained at lower energies and with the available theoretical calculations.

Summary

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Session Classification: Parallel 3