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Measurement of quarkonium production and polarization in pp and Pb-Pb collisions with ALICE

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Quarkonia are excellent probes of deconfinement in heavy-ion collisions. For J/ψ , a bound state of $c\bar{c}$ quarks, the (re-)generation is found to be the dominant production mechanism at the LHC energies. On the other hand, the non-prompt component of J/ψ production originating from b-hadron decays allows one to access the interaction of b-quarks with the QGP. Polarization and spin alignment measurements could also be used to investigate the characteristics of the formed medium. Different polarization for the J/ψ in Pb-Pb as compared to pp could be related to the modification of the J/ψ feed down fractions, due to the suppression of the excited states in the QGP, but also to the contribution of the regenerated J/ψ in the low p_T region. Moreover, it has been hypothesized that quarkonium states could be polarized by the strong magnetic field, generated in the initial state of the collision, and by the large angular momentum of the medium in non-central heavy-ion collisions. In pp collisions, polarization measurements are useful tools to understand particle production mechanisms. In this talk, the measurements of the inclusive, prompt and non-prompt J/ψ nuclear modification factor in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02\text{TeV}$ and midrapidity will be shown. The determination of the non-prompt J/ψ fraction extends down to very low p_T with a significantly improved precision compared to previous publications. The recently published results on the J/ψ polarization with respect to the event-plane in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02\text{TeV}$ and forward rapidity will be presented. The preliminary measurement of the $\psi(1S)$ polarization in pp collisions at $\sqrt{s} = 13\text{TeV}$ as a function of the transverse momentum will also be discussed. Results will be compared with available calculations.

Present via

Online

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