Contribution ID: **211** Type: **Oral report**

Review on charmonium nuclear modification factor and flow coefficients in Pb-Pb and p-Pb collisions with ALICE

Friday 24 September 2021 16:10 (25 minutes)

The quark-gluon plasma (QGP) is a strongly-interacting deconfined state of matter produced in ultra-relativistic heavy-ion collisions. In order to study the QCD matter and its evolution, quarkonia, bound states of a heavy quark and antiquark pair, are preferred tools as they are sensitive to the first stages of the collision and to the evolution of the created system. The study of the quarkonia relies on various observables, two of which will be presented: the nuclear modification factor and the flow.

Measuring nuclear modification factors in large collision systems gives information regarding QGP effects on quarkonium production.

Measurements of the azimuthal anisotropies (expressed as elliptic and triangular flows, v_2 and v_3 respectively) shed light on collective behaviors of the particles within this hot and dense medium.
Measuring azimuthal anisotropies for these hard probes gives us information regarding their own production mechanisms, and the formation of the QGP.

In this contribution, we review the results from the ALICE collaboration regarding the charmonium nuclear modification factor and flow. The R_{PbPb} and R_{pPb} as a function of p_{T}, rapidity and centrality will be presented.
Concerning the flow, we review ALICE measurements for Pb-Pb collisions at $\sqrt{s_{\mathrm{NN}}} = 5.02$ TeV in which the J/ψ exhibits a significant non-zero v_2 in a wide centrality and p_{T} range as well as a significant non-zero v_3. In the p-Pb system, which is typically used as a standard candle for cold nuclear matter effects in Pb-Pb, J/ψ does display a non-zero v_2 for $3 < p_{\mathrm{T}} < 6$ GeV/c whose magnitude is even comparable to the one from Pb-Pb collisions. The smallest hadronic system pp is being investigated in view of production and prospects for measurements of flow are discussed.

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Session Classification: Section 4. Relativistic nuclear physics, elementary particle physics and high-energy physics

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