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Quarkonium measurements in nucleus-nucleus collisions with ALICE

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Quarkonia, i.e. bound states of $b\bar{b}$ and $c\bar{c}$ quarks, are powerful observables to study the properties of nuclear matter under extreme conditions. The formation of a Quark-Gluon Plasma (QGP), which is predicted by lattice calculations at high temperatures as reached at LHC energies, has a strong influence on the production and behavior of quarkonia. A suppression, due to the color screening effect, with respect to the proton-proton results scaled by the number of binary collisions is expected. However, charmonium measurements from Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ and 5.02 TeV revealed a smaller suppression than what was observed at lower energies at the SPS and RHIC. Concurrently, the produced J/ψ present a significant elliptic flow (v_2) in semi-central collisions. These measurements point to a competition between charmonium suppression and (re)generation at LHC energies, with a participation of the charm quarks to the collectivity of the medium. Thus quarkonium measurements offer great possibilities to gain further knowledge about the QGP.

In this presentation, latest ALICE results on the bottomonium and charmonium production in nucleus-nucleus collisions will be presented. This includes measurements of $\Upsilon(1S)$ and $\Upsilon(2S)$ nuclear modification factors (R_{AA}) at forward rapidity and the charmonium R_{AA} and v_2 as a function of centrality, p_T and rapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. Also, first results from J/ψ measurements in Xe-Xe collisions at $\sqrt{s_{NN}} = 5.44$ TeV will be presented. Further on, the experimental results will be compared to various calculations from theoretical models.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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