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J/ψ photoproduction and the production of dileptons via photon-photon interactions in hadronic Pb-Pb collisions measured with ALICE

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Photon-photon and photonuclear reactions are induced by the strong electromagnetic field generated by ultra-relativistic heavy-ion collisions. These processes have been extensively studied in ultra-peripheral collisions with impact parameters larger than twice the nuclear radius. Since a few years, both the photoproduction of the J/ψ vector meson and the production of dileptons via photon-photon interactions have been observed in A-A collisions with nuclear overlap. Photoproduced quarkonia can probe the nuclear gluon distributions at low Bjorken-x, while the continuum dilepton production could be used to further map the electromagnetic fields produced in heavy-ion collisions and to study possible induced or final state effects in overlapping hadronic interactions. Both measurements are complementary to constrain the theory behind photon induced reactions in A-A collisions with nuclear overlap and the potential interaction of the measured probes with the formed and fast-expanding QGP medium. In this presentation, measurements of coherent J/ψ photoproduction cross sections in Pb-Pb collisions in the 40%-90% centrality range, measured at midrapidity in the dielectron channel with ALICE, will be presented for the first time using the full Run 2 data. Thanks to the excellent tracking resolution of the TPC, the transverse momentum distribution of coherently photoproduced J/ψ can be accurately measured. Final results on coherent J/ψ photoproduction cross sections at forward rapidity in the dimuon decay channel in the 30-90% centrality range will also be shown. Finally, the measurement of an excess in the midrapidity dielectron yield at low mass and p_{T}, in the centrality interval 50-90% will be shown. Results will be compared with available models.

In-person participation

No

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