Beitrag ID: **51** Typ: **Talk**

J/ψ photoproduction in Pb–Pb collisions with nuclear overlap at ALICE

Mittwoch, 29. März 2023 09:00 (20 Minuten)

Photonuclear reaction is induced by the strong electromagnetic field generated by ultrarelativistic heavy ion collisions. This process has been extensively studied in ultra-peripheral collisions (UPC). Photoproduced quarkonia are used to probe the nuclear gluon distributions at low Bjorken-x. In recent years, the coherent photoproduction of the J/ψ vector meson has also been observed in A-A collisions with nuclear overlap. This observation raises several theoretical challenges, such as the survival of the coherence condition for a nucleus broken during the hadronic interaction or the possible interaction of the produced J/ψ vector meson with a fast-expanding quark-gluon plasma medium. In this presentation, measurements of coherent J/ψ photoproduction cross sections in Pb-Pb collisions for the 40-90$\%$ centrality range, measured by ALICE at midrapidity in the dielectron channel will be presented. In peripheral collisions, the p_{T}-differential cross section is extracted for the first time at midrapidity. Final published results on coherent J/ψ photoproduction cross sections at forward rapidity in the dimuon decay channel in the 10-90$\%$ centrality range will also be shown. Finally, the status of the new rapidity-differential measurement of coherently photoproduced J/ψ at forward rapidity in the centrality range 70-90$\%$ will be discussed. Results will be compared with available theoretical models.

Experiment/Theory

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Sitzung Einordnung: Parallel: Early-Time Dynamics & nPDFs

Track Klassifizierung: Early time dynamics and nuclear PDFs