Société Française de Physique

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J/ψ photoproduction in Pb−Pb collisions with nuclear overlap measured in ALICE at LHC.

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The presence of an unexpected significant excess of low p_T J/ψ over the expected hadronic J/ψ production was confirmed in peripheral Pb−Pb collisions and observed for the first time in semi-central Pb−Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV with ALICE at LHC. The measurements were performed in the dimuon decay channel at forward rapidity ($2.5 < y < 4$) and in the dielectron decay channel at mid-rapidity. Surprisingly, a large increase in the J/ψ nuclear modification factor was observed in peripheral Pb−Pb collisions at low p_T, below 0.3 GeV/c. Most of the excess is believed to originate from a coherent photoproduction mechanism, which was unexpected until few years ago in peripheral collisions with nuclear overlap and is well known in ultraperipheral Pb−Pb collisions. The coherent photoproduction implies the interaction of a quasi-real photon coherently with the full Pb target nucleus, which remains intact. Many theoretical models developed for ultraperipheral collisions have tried to extend the description of the coherent J/ψ photoproduction mechanism to Pb−Pb collisions with nuclear overlap. In this presentation, I will show the results obtained with ALICE, and will compare them to theoretical calculations. And I will introduce the most recent analysis of the rapidity differential coherent J/ψ photoproduction cross section measurement at forward rapidity in ALICE.

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