

## Photoproduction of $J/\psi$ and dileptons in events with nuclear overlap with ALICE

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Photon-photon reactions and the production of the  $J/\psi$  meson through photonuclear reactions have been extensively studied in ultra-peripheral heavy-ion collisions, in which the impact parameter is larger than twice the nuclear radius. In recent years, coherently photoproduced  $J/\psi$  and dilepton production via photon-photon interactions have also been observed in nucleus-nucleus (A-A) collisions with nuclear overlap. Such quarkonium measurements can help to constrain the nuclear gluon distributions at low Bjorken- $x$  and high energy, while the continuum dilepton production could be used to further map the electromagnetic fields produced in heavy-ion collisions. In addition, these measurements can shed light on the theory behind photon-induced reactions in A-A collisions with nuclear overlap, including possible interactions of the measured probes with the formed and fast expanding quark-gluon plasma. Furthermore, the produced quarkonium is expected to keep the polarization of the incoming photon due to  $s$ -channel helicity conservation. Thus, in order to confirm the photoproduction origin of the very low- $p_T$   $J/\psi$  yield excess, polarization measurement is an important observable. The ALICE detector can perform quarkonium production measurements at both mid ( $|y| < 0.9$ ) and forward ( $2.5 < y < 4$ ) rapidities down to  $p_T = 0$ . In this presentation, the new ALICE measurements of the  $J/\psi$   $y$ -differential cross section and the first polarization results of coherently photoproduced  $J/\psi$  via the dimuon decay channel at forward rapidity in Pb-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV are reported. Additionally, the measurement of an excess with respect to expectations from hadronic production in the dielectron yield, at low mass and  $p_T$ , at midrapidity in Pb-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV is presented. The results are compared with available theoretical models.

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