

# $J/\psi$ photoproduction, and exclusive dimuon production, in p–Pb collisions at $\sqrt{s_{NN}} = 8.16$ TeV at the LHC with the ALICE experiment

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**Abstract.**

Photonuclear interactions are studied in p-Pb collisions with ALICE, where the photon radiated by a Pb nucleus probes the gluon density at low Bjorken- $x$  in the proton. The exclusive  $J/\psi$  photoproduction cross section  $\sigma(\gamma + p \rightarrow J/\psi + p)$  is expected to grow as a power law with  $1/x$ , but it should soften at low  $x$  if there is gluon saturation, as predicted by the color glass condensate effective field theory. The dissociative  $J/\psi$  photoproduction cross section  $\sigma(\gamma + p \rightarrow J/\psi + X)$  is sensitive to the quantum fluctuations of the configurations of the proton, and could therefore contain the signature of saturation effects. Both cross sections have been measured with the ALICE experiment, and this is the first time that dissociative  $J/\psi$  photoproduction is measured at the LHC. In addition, dimuons produced in two-photon interactions are measured for the first time with ALICE at low mass. This measurement should allow to fix the photon fluxes of nuclei and is important to investigate the feasibility of timelike Compton scattering.

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