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Exclusive J/ψ photoproduction in ultra-peripheral p-Pb collisions at $\sqrt{s_{\rm NN}}$ = 5.02 TeV

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The ALICE Collaboration has measured exclusive J/ψ photoproduction off protons in ultra-peripheral proton-lead collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV for the first time. Exclusive photoproduction of charmonium is a powerful tool to search for saturation effects. Although gluon saturation is the most straightforward mechanism to slow down the growth of the probability density function (PDF) for gluons at small-x, no compelling evidence for this effect has been found so far. Parton saturation would have important applications in small-x physics and in the early stages of ultra-relativistic heavy-ion collisions produced at RHIC and LHC. The results are compared to STARLIGHT and to QCD based models. We extend HERA measurements up to about the TeV energy domain without experimental ambiguity on the photon source. Our results provide direct tests of the power law dependence of the J/ψ photoproduction cross section over a wide range of γp energies.

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