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Exclusive photo-production of upsilon in pPb collisions at CMS

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Relativistic heavy ions are a copious source of virtual photons, which allow to study the gamma-proton and gamma-gamma interactions in ultraperipheral collisions (UPC). The exclusive photoproduction of heavy vector mesons provide a clean probe of the gluon distribution at very small values of parton fractional momenta (Bjorken x) $x \approx 10^{-2}.10^{\cdot 4}$ at central rapidities ($|y| < 2.5$) and search for saturation phenomena. We present the first measurement of exclusive photoproduction of Υ (1S,2S,3S) states in their dimuon decay channel in ultraperipheral collisions of protons and heavy ions (pPb) with the CMS experiment at $\sqrt{s_{NN}} = 5.02$ TeV for an integrated luminosity $L_{int} = 33$ nb^{-1}. The photoproduction cross-section of Υ (1S) is measured as a function of photon-proton center-of-mass energy $W_{\gamma p}$. The differential cross-section $d\sigma/dt$, where t is the squared four-momentum transfer at the photon-proton vertex, is measured in the range $|t| < 1.0$ (GeV/c)^2 . The results are compared with other measurements and theoretical predictions.

On behalf of collaboration:

CMS

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