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Measurement of exclusive $\rho(770)(0)$ photoproduction in ultraperipheral pPb collisions at root $s(NN)=5.02$ TeV

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Abstract

Exclusive $\rho(770)(0)$ photoproduction is measured for the first time in ultraperipheral pPb collisions at $\sqrt{s(NN)} = 5.02$ TeV with the CMS detector. The cross section $s(p,\rho(770)(0))$ is 11.0 ± 1.4 (stat) ± 1.0 (syst) μb at $W_p = 92.6$ GeV for photon-proton centre-of-mass energies W_p between 29 and 213 GeV. The differential cross section $ds/d|t|$ is measured in the interval $0.025 < |t| < 1$ GeV² as a function of W_p , where t is the squared four-momentum transfer at the proton vertex. The results are compared with previous measurements and theoretical predictions. The measured cross section $s(p,\rho(770)(0))$ has a power-law dependence on the photon-proton centre-of-mass, consistent with electron-proton collision measurements performed at HERA. The W_p dependence of the exponential slope of the differential cross section $ds/d|t|$ is also measured.

Keywords

Keywords Plus: J/PSI PHOTOPRODUCTION; GLUON SATURATION; MESON PRODUCTION; RHO; PROTON; ELECTROPRODUCTION; DEPENDENCE; PHOTON; MASS

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