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Measurement of inclusive very forward jet cross sections in proton-lead collisions at √sNN = 5.02 TeV (Article) (Open Access)

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Abstract

Measurements of differential cross sections for inclusive very forward jet production in proton-lead collisions as a function of jet energy are presented. The data were collected with the CMS experiment at the LHC in the laboratory pseudorapidity range $-6.6 < \eta < -5.2$. Asymmetric beam energies of 4 TeV for protons and 1.58 TeV per nucleon for Pb nuclei were used, corresponding to a center-of-mass energy per nucleon pair of sNN = 5.02 TeV. Collisions with either the proton (p+Pb) or the ion (Pb+p) traveling towards the negative η hemisphere are studied. The jet cross sections are unfolded to stable-particle level cross sections with $p_T \gtrsim 3$ GeV, and compared to predictions from various Monte Carlo event generators. In addition, the cross section ratio of p+Pb and Pb+p data is presented. The results are discussed in terms of the saturation of gluon densities at low fractional parton momenta. None of the models under consideration describes all the data over the full jet-energy range and for all beam configurations. Discrepancies between the differential cross sections in data and model predictions of more than two orders of magnitude are observed.[Figure not available: see fulltext.]. © 2019, The Author(s).

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