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Measurement of Feynman-x Spectra of Photons and Neutrons in the Very Forward Direction in Deep-Inelastic Scattering at HERA

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Measurements of normalised cross sections for the production of photons and neutrons at very small angles with respect to the proton beam direction in deep-inelastic ep scattering at HERA are presented as a function of the Feynman variable x_F and of the centre-of-mass energy of the virtual photon-proton system W . The data are taken with the H1 detector in the years 2006 and 2007 and correspond to an integrated luminosity of 131 pb^{-1} . The measurement is restricted to photons and neutrons in the pseudorapidity range $\eta > 7.9$ and covers the range of negative four momentum transfer squared at the positron vertex $6 < Q^2 < 100 \text{ GeV}^2$, of inelasticity $0.05 < y < 0.6$ and of $70 < W < 245 \text{ GeV}$. To test the Feynman scaling hypothesis the W dependence of the x_F dependent cross sections is investigated. Predictions of deep-inelastic scattering models and of models for hadronic interactions of high energy cosmic rays are compared to the measured cross sections.

additional information

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