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Measurement of Photon Production in the Very Forward Direction in Deep-Inelastic Scattering at HERA [H1]

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The production of photons at very small angles with respect to the proton beam direction is studied in deep-inelastic positron-proton scattering at HERA. The data are taken with the H1 detector in the years 2006 and 2007 and correspond to an integrated luminosity of $126\mathrm{pb}^{-1}$. The analysis covers the range of negative four momentum transfer squared at the positron vertex $6 < Q^2 < 100$ GeV^2 and inelasticity $0.05 < y < 0.6$. Cross sections are measured for the most energetic photon with pseudorapidity $\eta > 7.9$ as a function of its transverse momentum p_T^{lead} and longitudinal momentum fraction of the incoming proton x_L^{lead}. In addition, the cross sections are studied as a function of the sum of the longitudinal momentum fraction x_L^{sum} of all photons in the pseudorapidity range $\eta > 7.9$. The cross sections are normalised to the inclusive deep-inelastic scattering cross section and compared to the predictions of models of deep-inelastic scattering and models of the hadronic interactions of high energy cosmic rays.

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