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Further studies of isolated photon production with a jet in deep inelastic scattering at HERA

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Isolated photons with high transverse energy have been studied in deep inelastic ep scattering with the ZEUS detector at HERA, using an integrated luminosity of 326 pb^{-1} in the range of exchanged-photon virtuality $10 - 350 \text{ GeV}^2$. Outgoing isolated photons with transverse energy $4 < E_T^\gamma < 15 \text{ GeV}$ and pseudorapidity $-0.7 < \eta^\gamma < 0.9$ were measured with accompanying jets having transverse energy and pseudorapidity $2.5 < E_T^{\text{jet}} < 35 \text{ GeV}$ and $-1.5 < \eta^{\text{jet}} < 1.8$, respectively. Differential cross sections are presented for the following variables: the fraction of the incoming photon energy and momentum that is transferred to the outgoing photon and the leading jet; the fraction of the incoming proton energy transferred to the photon and leading jet; the differences in azimuthal angle and pseudorapidity between the outgoing photon and the leading jet and between the outgoing photon and the scattered electron. Comparisons are made with theoretical predictions: a leading-logarithm Monte Carlo simulation, a next-to-leading-order QCD prediction, and a prediction using the k_T -factorisation approach.

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