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Measurement of Internal Jet Structure in Dijet Production in Deep Inelastic Scattering and Photoproduction at HERA

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The internal structure of jets in dijet production in deep inelastic scattering and in tagged photoproduction is measured with the H1 detector at HERA. In the kinematical region of squared momentum transfers of $10 < Q^2 \leq 120\,\mathrm{GeV}^2$ and x-Bjorken values of $2{\cdot}10^{-4} \leq x_{Bj} \leq 8{\cdot}10^{-3}$ jets with transverse energies of $E_{t,Breit} > 5\,\mathrm{GeV}$ are selected in the Breit frame employing k_t and cone jet algorithms. Measured observables are jet shapes and subjet multiplicities as a function of the resolution parameter. Both observables are corrected for detector effects and presented as functions of the transverse jet energy and jet pseudorapidity. The corrected data are well described by Monte Carlo models. A dependence of the jet broadness and the average number of subjets on the transverse energy and the pseudorapidity of the jet is observed. With increasing transverse jet energies and decreasing pseudorapidities, i.e. towards the photon hemisphere, the jets are more collimated. Furthermore the jets defined by the k_t algorithm turn out to be narrower than jets defined by the cone algorithm. Using the k_t algorithm, measurement of subjet multiplicities have also been performed in tagged photoproduction events. They are presented as a function of the subjet resolution parameter y_{cut} and the transverse energy and the pseudorapidity of the jets.