HADRONIC ENERGY FLOW AND INCLUSIVE CHARGED PARTICLE PRODUCTION AT HERA

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Synopsis

The energy flow in hard photoproduction interactions has been studied using data collected by the H1 detector at HERA during the 1993 data taking period. The production of jets and the energy flow about the resulting jet axis have been studied using a cone jet algorithm. The increased energy flow about the jet axis for jets reconstructed in the proton direction, compared with predictions of Monte Carlo event generators incorporating leading order pQCD calculations together with initial and final state radiation, is illustrated. The description of the energy flow has been found to be improved when multiple interactions models have been included.

The presence of multiple interactions has been further explored by studying charged particle production in the region $2.0 < \eta < 2.5$. To facilitate this the performance of the H1 Forward Tracker has been studied in detail, and the corrected track multiplicity measured in this region. This has further illustrated the inadequate description of photoproduction provided by leading order Monte Carlo generators and the improved description provided by the inclusion of multiple interaction models.

Cross sections are presented for the inclusive photoproduction of charged particles in the kinematical region $2.0 < \eta < 2.5$ and $p_T > 1.5$GeV/c. The transverse momentum distribution is found to be well described by a QCD inspired power law fit, and is found to be harder than observed in $p\bar{p}$ interactions at comparable centre of mass energies, $\sqrt{s_{\gamma p}} \approx \sqrt{s_{p\bar{p}}} \approx 200\,\text{GeV}$.

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