Track Reconstruction In The Forward Muon Subdetector And Investigations Concerning The Photon Remnant In The H1 Detector At HERA.

by

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Synopsis

A brief overview of some of the physics possibilities at HERA is presented followed by an overview of the H1 detector. The forward muon spectrometer is described in detail. Simulated events are used to test the performance of the forward muon reconstruction code with and without the new phi chambers. The code is found to perform well except for a systematic shift in the value of the reconstructed momentum for low momentum tracks.

Photoproduction candidates from the 1992 data taking run are examined in the region $Q^2<0.01$, $0.2<y<0.7$ using tagged electrons as a trigger signal. 4345 candidates remain after cuts, in line with predictions from the PYTHIA 5.6 Monte Carlo using the GRV and LACIII photon structure function parameterisations. 467 events with two or more jets are found using the LUCELL cone algorithm and the distributions of jets and charged tracks in the two-jet sample examined. Good agreement is found except in the forward region, $\eta>1.0$, where more jets and tracks were observed than predicted.

The presence of a photon remnant in principle provides a clear discrimination between direct and resolved photoproduction events. Two algorithms for finding this remnant are considered and compared. Photon remnants are found in a substantial fraction of events with both algorithms, confirming that the events observed are mostly resolved. The properties of the remnant are examined and found to be in good agreement with Monte Carlo.

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