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The H1 Forward Proton Spectrometer

H1 Collaboration

Abstract

The H1 collaboration at the HERA collider has operated in 1995 a forward proton spectrometer with two detector stations at 81 and 90 m beyond the interaction point. The HERA machine magnets are employed for momentum analysis. The detector systems consist of scintillating fiber hodoscopes sandwiched between trigger scintillation counters. Multi-pixel photomultipliers are used to read out the light fibers. The configuration of the HERA beam line is such that two independent measurements of the longitudinal momentum of forward scattered protons are possible. The requirement that the two measurements have to agree within errors is the basis for a self-calibration of the system with data recorded during physics runs. This calibration procedure is largely independent of the precise details of the location of the detectors with respect to the H1 experiment. The largest systematic uncertainty is due to measurement errors of the position of the circulating proton beam. A momentum resolution of ± 4 GeV is observed at a longitudinal momentum of about 750 GeV.

Plenary Sessions:
2. New Experimental Techniques and Detectors - E. Iarocci
Parallel Session: IV Tools
17. New Detectors and Experimental Techniques