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TRACKING SYSTEMS OF THE COLLIDER DETECTOR AT FERMILAB

The CDF Collaboration
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A description of the tracking systems of the Collider Detector at Fermilab (CDF) will be given. Fermilab is constructing the Central Tracking Chamber, the Vertex Time Projection Chambers, and the Forward Tracking Chambers. Some of the construction details and test results will be shown. Forward Tracking Chambers for measuring the trajectories of those charged particles within 2^{o} and 10^{o} cones are built with radial sense wires and cathode planes. Test results using cosmic rays and a nitrogen UV-laser show that single wire resolution of 110 μm and 68 μm are obtainable respectively from the Radial Wire Drift Chambers. The Vertex TPC's have been successfully used for tracking charged particles during the $\bar{p}p$ run at a center of mass energy of 1.6 TeV on October 13, 1985. The Central Tracking Chamber is under construction.

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CDF End Plug E.M. Calorimeter Calibration and Monitoring

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After four generations of prototyping, two final end plug e.m. calorimeter modules for CDF at Fermilab have been constructed. The modules are designed to plug a 3 m D x 5 m L solenoid at the both ends covering up to $\theta = 36^{o}$ leaving conical holes of $\theta = 10^{o}$ at the center. In each of the modules thirty four layers of proprotional tube arrays are interleaved with 2.7 mm thick lead absorber panels. The proprotional tubes are made of conductive plastic tubes of 7 mm x 7 mm ID with 0.8 mm thick wall with 50 μm anode wires. The tube arrays are trimmed and sandwitched by two G-10 panels to form four fan-shaped quadrants in azimuth in each layer. The energy flow measurement is done mainly by cathode pads which are segmented into $\Delta\eta = 0.09$ and $\Delta\varphi = 5^{o}$ flared with increasing depth along z. The pads at the same (η,φ) coordinate are ganged together into three longitudinal segments of projective towers. Partially implemented strips, circular θ- and radial φ-strips, and the anode wires provide additional informations. The calorimeters have been calibrated by 100 GeV electrons extensively and detailed map of the local response have been obtained. In order to monitor the gas gain, Fe-55 sources were embedded within the module gas vessels, each mounted on a short proportional tube made of an identical plastic tube as those in the calorimeter. It has been demonstrated that the 5.9 keV signals trace the calorimeter response against 100 GeV electron shower to an accuracy of better than a per cent.