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*The L3 High Resolution Multi-Sampling Drift Chambers*

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*The L3 experiment, due to take data in 1989, aims to determine muon energy up to 45 GeV with a resolution of 1.5%. The muon drift chambers consist of three coaxial cylinders with a length of 12 m and diameters of 3, 4.5 and 6 m. Each cylinder measures the position of a muon track with a resolution of 80 microns. The detector is an assembly of 16 modules, called octants. Each octant has its own UV laser to check the alignment of the chambers to 10 microns. Some special results from the tests of a prototype octant are discussed. A new effect, present in all time projection chambers for tracks parallel to the wire planes due to induced charge signals is presented in detail.*

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12.10

Construction of the CLEOII Drift Chamber

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We have constructed a new large drift chamber (2m long and 2m in diameter) for the CLEO II experiment at the Cornell Electron Storage Ring (CESR). The chamber contains 51 readout layers including 11 stereo layers, with 48,480 (12,240) total (sense) wires. Field wires on the innermost and outermost layers were replaced by segmented cathode strips to provide two accurate measurements of the longitudinal coordinate. Large aluminum on Mylar printed circuit boards were used for the cathode strips. Very low density support structures were developed to accurately hold the cathode strips. Aluminum wire was used for the majority of the field wires to reduce multiple scattering. We developed a semiautomatic apparatus to string wires with the chamber in the vertical position, which also allowed easy replacement of any wire in the chamber. A maximum stringing rate of 60 wires/hour was achieved. The tension on all wires was measured soon after they were strung; the typical failure rate due to improper tension was 1-2%. Hybrid preamplifiers were developed and mounted directly on the chamber on custom printed circuit boards. Each board also contains a pulser calibration system and a high voltage current monitor, which will be activated by external computer control. Positive high voltage power supplies were developed to individually supply each of the 51 layers under computer control. A new type of hardware track finder was developed for the trigger.