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SiD Vertex Detector Mechanical Design

Sunday, 12 March 2006 11:00 (25 minutes)

The present mechanical design of the vertex detector for SiD will be described. The design includes a 12.5 cm long central barrel with silicon pixels. Four disks with silicon pixels and three additional disks, which could be based upon silicon pixels or micro-strips, are located beyond each barrel end. Since sensor technologies are rapidly evolving and final operating requirements are uncertain, we have assumed sensor operation at -10 Celsius or above and air-cooling. That allows the number of radiation lengths represented by the vertex detector to be limited. Carbon fiber structures integrate silicon support with support of a beryllium beam tube. Initial estimates of the number of radiation lengths represented by the vertex detector, power removed by air-cooling, and sensor temperatures will be given.

Summary

The present mechanical design of the vertex detector for SiD is integrated with both the design of the SiD outer tracker and with beam tube support. A method to allow vertex detector servicing has been taken into account in developing the design. The design includes a 12.5 cm long central barrel with silicon pixels. Four disks with silicon pixels and three additional disks, which could be based upon silicon pixels or micro-strips, are located beyond each barrel end. Since sensor technologies are rapidly evolving and final operating requirements are uncertain, we have assumed sensor operation at -10 Celsius or above and air-cooling. That allows the number of radiation lengths represented by the vertex detector to be limited. Carbon fiber structures integrate silicon support with support of a beryllium beam tube. Initial estimates of the number of radiation lengths represented by the vertex detector, power removed by air-cooling, and sensor temperatures will be given.

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