

Development of the Silicon Tracker for CEPC

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The Circular Electron Positron Collider (CEPC) has been proposed as a Higgs/ Z^0 (flavor) factory, which would allow precision measurements of the Higgs boson properties, as well as of W^\pm/Z^0 bosons. The baseline design of CEPC tracking system consists of a vertex detector with three concentric double-sided pixel layers and a silicon tracker with some layers on both barrel and end-cap regions, besides a large volume time projection chamber (TPC). Driven by physics studies and experimental conditions, the silicon tracking system has similar performance requirements to the ILC detectors, such as a single point resolution of a few micrometers, very low material budget (0.15% X_0 per layer for the vertex region and $<1\%X_0$ per layer for the outer tracker) and power consumption, but without power-pulsing, which leads to significantly additional constraints on detector specifications, especially for the case of machine operating at Z-pole energy region with high luminosity. In this presentation, I will give an overview of the CEPC tracker design, the requirements and challenges for each sub-system with possible technologies. The on-going R&D activities will also be reported on silicon pixel detector, based on monolithic CMOS pixel sensor (CPS) and Silicon on Insulator (SOI) technologies.

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