

# Development of a vertex detector prototype for the CEPC

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The Circular Electron Positron Collider (CEPC) introduces new challenges for the vertex detector in terms of material budget, spatial resolution, readout speed, and power consumption. A Monolithic Active Pixel Sensor (TaichuPix) has been developed for CEPC.

The baseline vertex detector is designed with a three double-layers barrel structure. This structure aims to minimize particle scattering and enhance the impact parameter. It involves installing silicon pixel sensors and cables on both sides of the support structure. Each ladder consists of a common support structure and two layers of silicon detectors.

The vertex detector prototype has been developed and characterized at the DESY test beam facility, and the results indicate a spatial resolution better than 5  $\mu\text{m}$  and a detection efficiency better than 99%.

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