

# Drift chamber with cluster counting technique for CEPC

*Friday 19 July 2024 08:30 (17 minutes)*

To achieve the physics goals of the Circular Electron Positron Collider (CEPC), a tracking system combining a silicon tracker and a drift chamber is proposed. The drift chamber could provide excellent particle identification (PID) performance with cluster counting (dN/dx) technique. By measuring the number of primary ionizations along the particle trajectory, the dN/dx will significantly improve the PID performance due to little sensitivity to Landau tails.

Detailed PID study of the drift chamber will be presented. Simulation study, including the detector and electronics responses as well as the reconstruction algorithm, is performed to optimize the detector design and performance. The results show the kaon and pion separation power with 1.2 track for 20 GeV/c momentum can reach  $3\sigma$ . Fast readout electronics was developed, and a detector prototype was tested with electron beam. The test results validate the performance of the electronics and the feasibility of dN/dx method.

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**Session Classification:** Detectors for Future Facilities, R&D, Novel Techniques

**Track Classification:** 13. Detectors for Future Facilities, R&D, Novel Techniques