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The Drift Chamber for CMD-3 detector

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The CMD-3 is a general-purpose detector at VEPP-2000 collider whose purpose is to study the exclusive modes of $e^+e^- \rightarrow \text{hadrons}$ in the center of mass energy range below 2 GeV. The CMD-3 results will provide an important input for the calculation of the hadronic contribution to the muon anomalous magnetic moment. An upgrade of the CMD-3 tracker is currently in progress. The proposed tracker is an ultra-light drift chamber equipped with cluster counting/timing techniques. The main features of this design are the high transparency in terms of multiple scattering contribution to the momentum measurement of charged particles and the precise particle identification (PID). The central tracker is a down sized drift chamber from the larger one designed for the IDEA detector at both FCC-ee and CEPC colliders. The chamber is divided in 2 parts. The innermost part is a drift chamber with the jet cells. They are open cells, in which the wires are axially arranged. Outside this part, the chamber has single-wire cells with the wires arranged in an appropriate stereo angle configuration. This external part is divided into three different cells configurations, the first one (innermost) has 4 layers with 4 cells per sector, the second one has 4 layers with 5 cells per sector and the last one (outermost) has 8 layers with 6 cells per sector. The structure of this drift chamber is presented, with a focus on the mechanical design of the end plates and the novel tension recovery scheme, which has two main objectives: the minimization of the amount of material in front of the end-plate crystal calorimeter and the maximization of the mechanical stability.

Collaboration

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