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The Tracking performance for the IDEA drift chamber

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The IDEA detector concept for a future e^+e^- collider adopts an ultra-low mass drift chamber as central tracking system. The He based ultra-low mass drift chamber is designed to provide efficient tracking, a high precision momentum measurement, and excellent particle identification by exploiting cluster counting technique. Studies with the Garfield++ simulation confirm that the cluster counting technique allows reaching a resolution two times better than the traditional charged particles mechanism dE/dx method. To study the impact of the cluster counting technique on physics events, an algorithm, which uses the energy deposit information provided by the Geant4 simulations, has been developed to reproduce the cluster size and the cluster density distributions in a fast and convenient way. This work describes the expected tracking performance, obtained with full simulation, for track reconstruction and particle identification on detailed simulated physics events. Moreover, the details of the drift chamber's construction parameters, including the inspection of new material for the wires, new techniques for soldering the wires, the development of an improved schema for the drift cell, and the choice of a gas mixture will be described.

In-person participation

No

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