Abstract Submitted
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Particle identification with the cluster counting technique for a drift chamber at CEPC SHUITING XIN, Institute of High Energy Physics — The Circular Electron Positron Collider(CEPC) is designed to operate at center-of-mass energies of 240 GeV as a Higgs factory, as well as at the Z-pole and the WW production threshold for electroweak precision measurements and study of flavor physics. A good identification of charged kaons is essential for the flavor physics and benefits the determination of jet flavor and jet charge. To achieve these physics goals, a design of tracking system combining a silicon tracker and a drift chamber is proposed. The silicon tracker provides excellent spatial resolution and granularity to cope with track separation in dense jets. The drift chamber could provide dN/dx measurements with cluster counting technique, as well as those of dE/dx. A simulation study on the cluster counting technique has been performed with the Garfield++ program, and the primary ionization, avalanche processes, and peak finding on the induction signals have been carefully investigated. The effects of the gas mixture, sampling frequency, and the noises are also taken into account. The study shows that the resolution and separation power with dN/dx method are significantly better than those of the traditional dE/dx method. A prototype system is being prepared to study feasibility of cluster counting technique.

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