1. Lxε calorimeter of the CMD-3 detector

The Lxε calorimeter system of the CMD-3 detector consists of cylindrical and double-layer calorimeters. The cylindrical part contains 20 identical modules, each of 8 radial layers. The double-layer calorimeter consists of two modules, each with 10 layers. The cylindrical part of the calorimeter is used to measure the energy of particles in the range from several GeV to several TeV. The double-layer calorimeter is used to measure the energy of particles in the range from several TeV to several PeV.

2. dE/dx vs. dE/dxPC general considerations

In the experiment, we use two sets of detectors: a hadron calorimeter based on the standard xenon calorimeter and a liquid xenon calorimeter with a high-pressure xenon filling. The hadron calorimeter is used to measure the energy of particles in the range from several GeV to several TeV. The liquid xenon calorimeter is used to measure the energy of particles in the range from several TeV to several PeV.

3. General idea of the charged particle identification (PID) procedure

The goal of the charged particle identification (PID) procedure is to determine the type of charged particle (proton, pion, kaon, etc.) based on the energy deposition in the calorimeter and the drift chamber. The PID procedure consists of two steps: the selection of candidate events and the identification of the particle type.

4. Selection of the best classifier

This step involves selecting the classifier that best separates the different types of charged particles based on the energy deposition in the calorimeter and the drift chamber. The classifier is selected based on its performance in terms of signal-to-background ratio and discrimination power.

5. Detector response tuning

The detector response tuning is performed using a set of measured data. The goal of the tuning is to optimize the performance of the calorimeter system in terms of energy resolution and particle identification efficiency.

6. Example: selection of e^+e^- → K^+K^- (γ) events for √s = 1.28 GeV (1.65 GeV)

We demonstrate the ability of the detector to identify e^+e^- → K^+K^- (γ) events in the energy range from 1.28 to 1.65 GeV by using the standard xenon calorimeter. The primary goal is to identify events with K^+ and K^- produced in the decay of the π^0 meson. The analysis is based on the energy deposition in the calorimeter and the drift chamber.