

E50 Tracker Simulation

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Abstract

This is the paper's abstract ...

1 Introduction

Outline The remainder of this article is organized as follows.

2 Vertex resolution

In this section, we derive the vertex resolution calculated by hit positions of 2 layers. Let (z_i, σ_i) be the z-position and position resolution of detector i ($i = 1, 2$).

When the detector i has hits at the position x_i , the vertex position X_0 is calculated as follows:

$$X_0 = \frac{x_2 z_1 - x_1 z_2}{z_1 - z_2}.$$

At first we fix the hit position on detector 1, the uncertainty of the position on detector 2 is propagated to the uncertainty of the vertex position as follows:

$$\sigma(X_0)_1 = \frac{\sigma_2 z_1}{z_1 - z_2}.$$

Next we fix the hit position on detector 2, the uncertainty of the vertex position is derived as follows:

$$\sigma(X_0)_2 = \frac{\sigma_1 z_2}{z_1 - z_2}.$$

Then, the total uncertainty of the vertex position is given by

$$\sigma(X_0) = \sqrt{\sigma(X_0)_1^2 + \sigma(X_0)_2^2} = \frac{\sqrt{\sigma_1^2 z_2^2 + \sigma_2^2 z_1^2}}{z_1 - z_2}$$

3 Conclusions

We worked hard, and achieved very little.