Analysis meeting : tracking comparison

Granjon Mathis

Electron selection

SD = comes out from GEANT 4
= SIMULATED

PTD = after trackfit (& cat) applied
= RECONSTRUCTED

Electron selection

SD = comes out from GEANT 4
= SIMULATED

Conditions :

- e- (tag from GEANT4)
- 2 vertices
  - 1 on OM (material change)
  - 1 on source foil

PTD = after trackfit (& cat) applied
= RECONSTRUCTED

Conditions :

- Charged particle that hit an OM
- 2 vertices
  - 1 on OM -> square of 200*200 mm^2
  - 1 on source foil -> ellipse of 2.5*3 cm^2

First comparison of the number of electrons

SD = comes out from GEANT 4
= SIMULATED

PTD = after trackfit (& cat) applied
= RECONSTRUCTED

We have 3 cases :

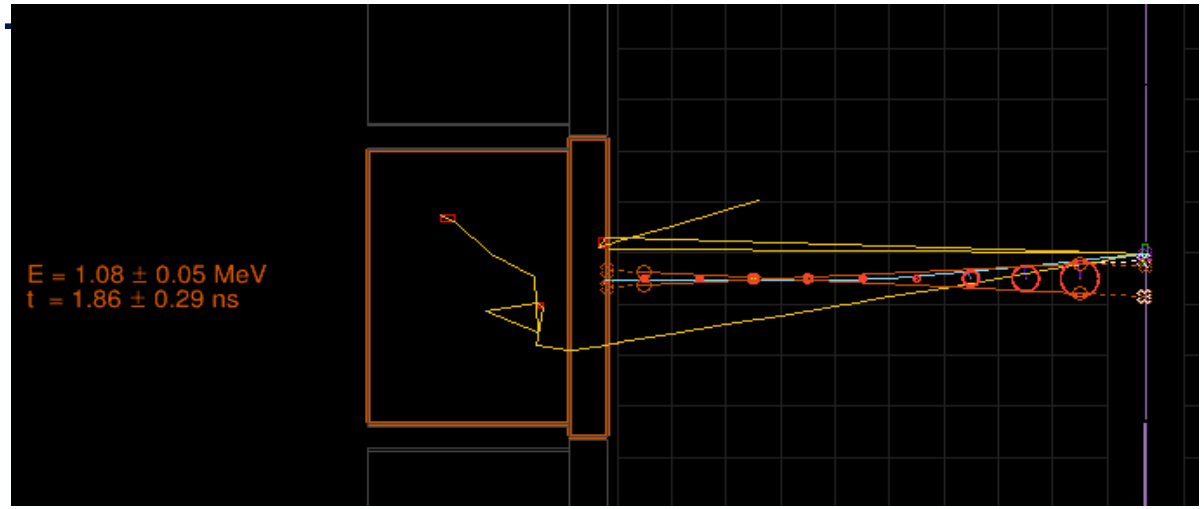
- Number electron PTD > SD → More reconstructed tracks than simulated
- Number electron PTD < SD
- Number electron PTD = SD

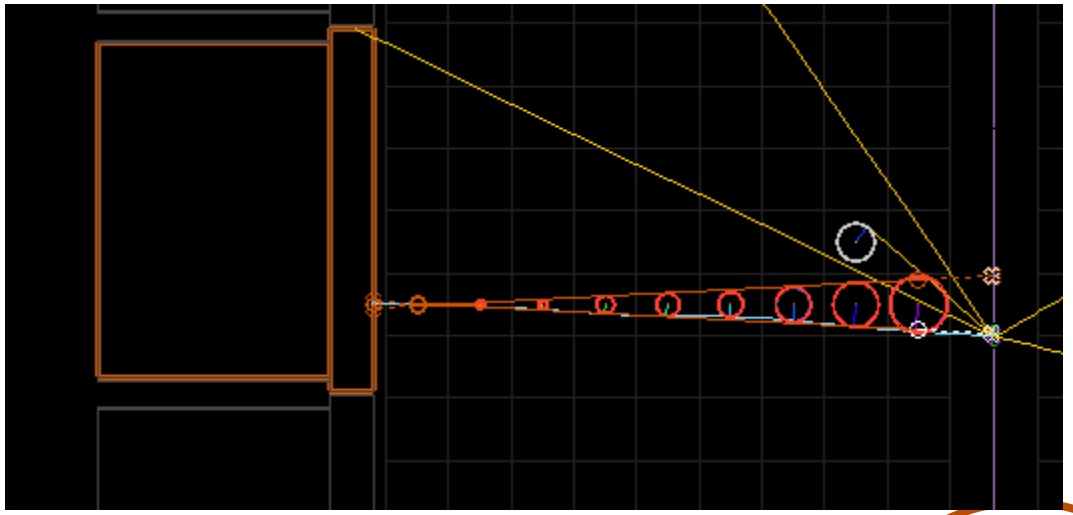
Number of e- : PTD > SD

More reconstructed tracks than simulated → Occurs when tracks are linea

Number of e- : PTD > SD

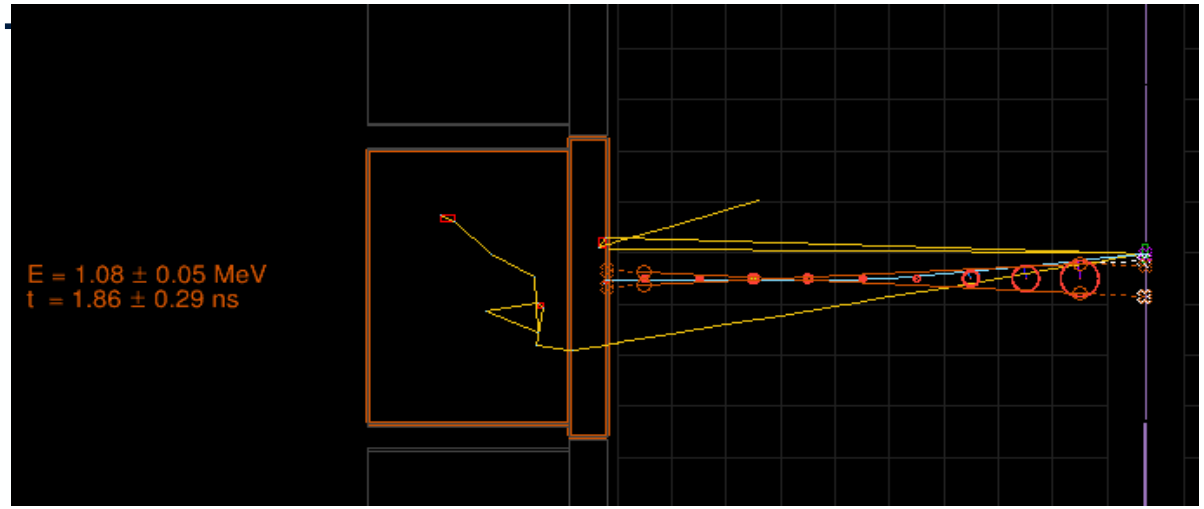
More reconstructed tracks than simulated → Occurs when tracks are linea

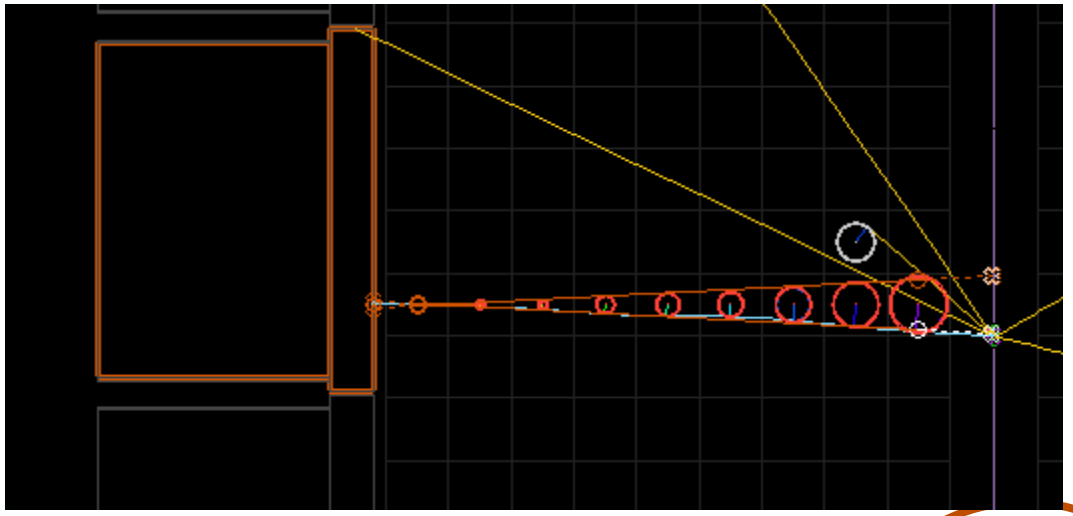




Number of e- : PTD > SD

More reconstructed tracks than simulated → Occurs when tracks are linea





→ Problem can be solved after with physics

First comparison of the number of electrons

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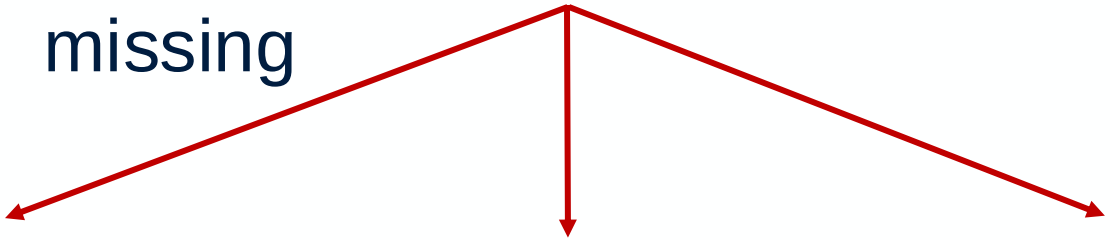
We have 3 cases :

- Number electron PTD > SD → More reconstructed tracks than simulated
- Number electron PTD < SD → Some reconstructed tracks are missing
- Number electron PTD = SD

Number of e- : PTD < SD

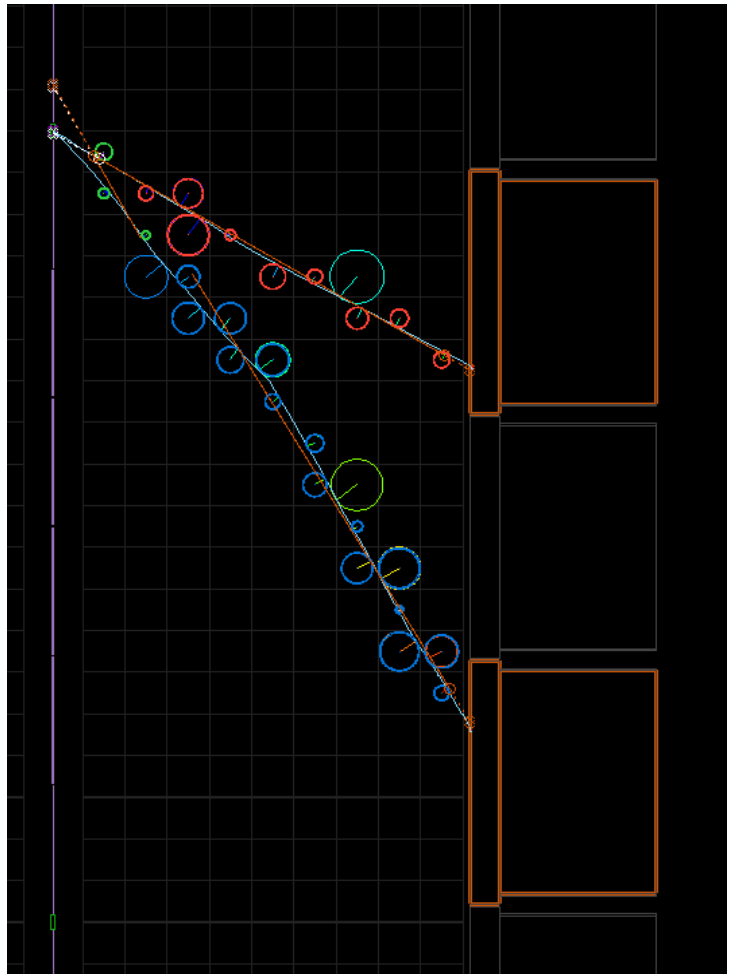
Some reconstructed tracks are missing



3 cases :

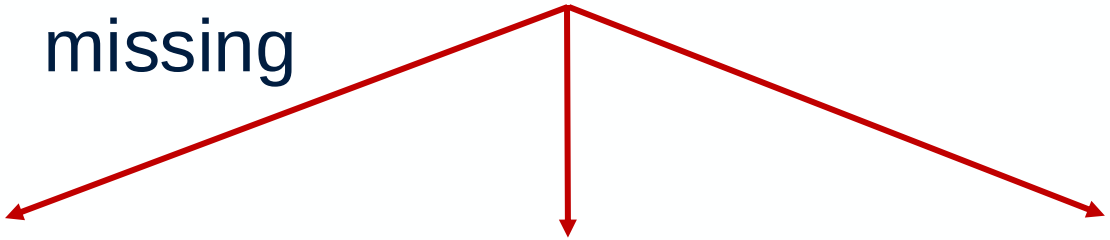
Kinked tracks

Some example of kinked tracks



Number of e- : PTD < SD

Some reconstructed tracks are missing

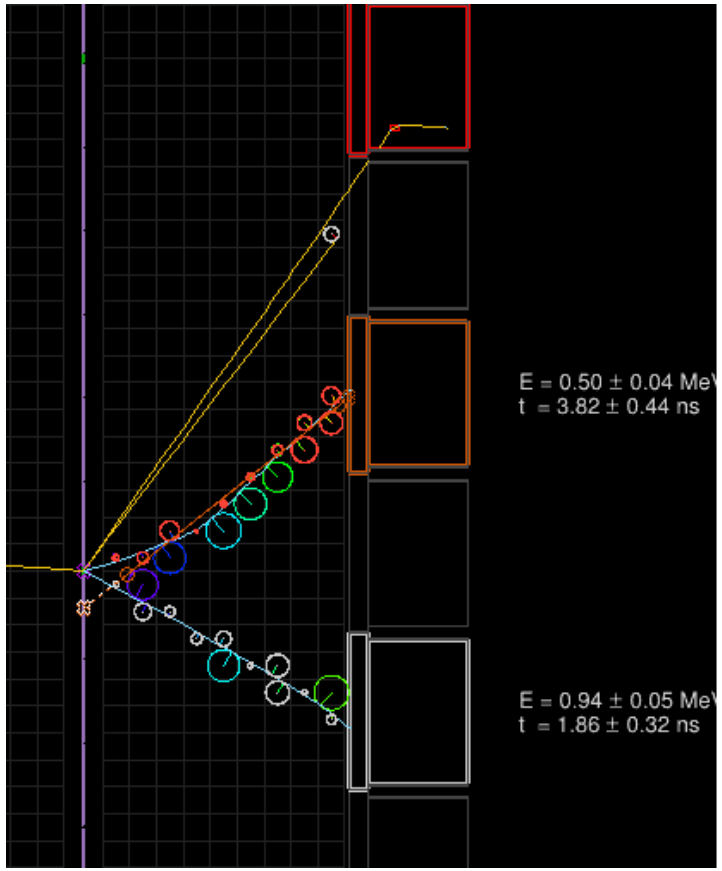


3 cases :

Kinked tracks

Unassociated calorimeter

Unassociated calorimeters -> to be investigated



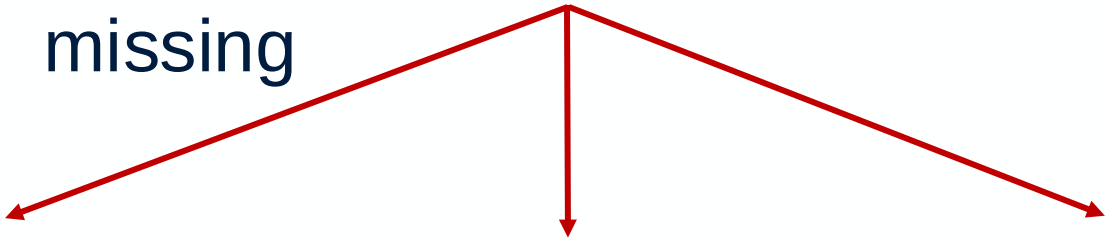
Unassociated = white

2 reasons :

- Kinked tracks
- Scattering on calorimeter

Number of e- : PTD < SD

Some reconstructed tracks are missing



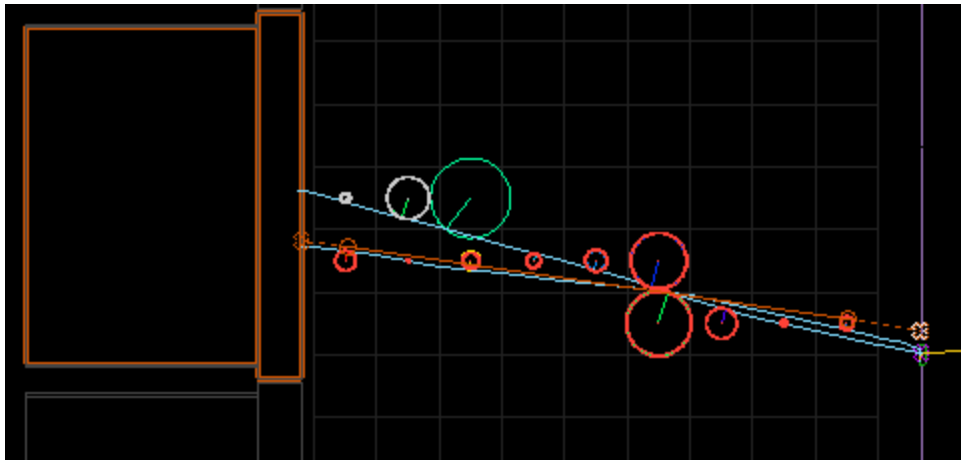
3 cases :

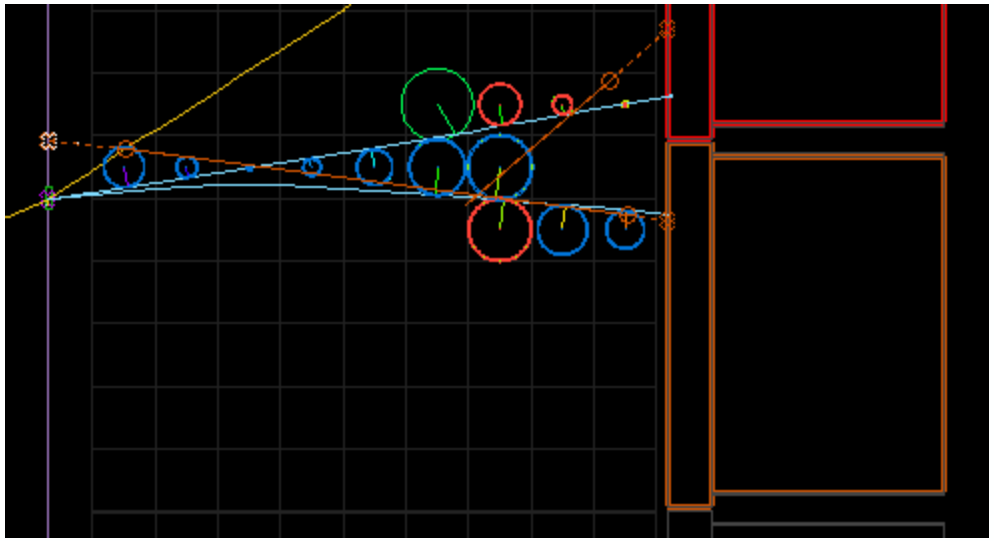
Kinked tracks

Unassociated calorimeter

2 SD tracks are too close

2 closes simulated tracks





Trackfit choose one on them or fit between the two

First comparison of the number of electrons

SD = comes out from GEANT 4
= SIMULATED

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= RECONSTRUCTED

10000 events simulated → 7333 events detected

- Number electron PTD > SD → 11.6%
- Number electron PTD < SD → 11.8 %
  - Kinked tracks → ~ 40 %
  - Unassociated calorimeter → ~ 40 %
  - 2 SD tracks too close → ~ 20 %

→ 76.6 %

PTD SD

First comparison of the number of electrons

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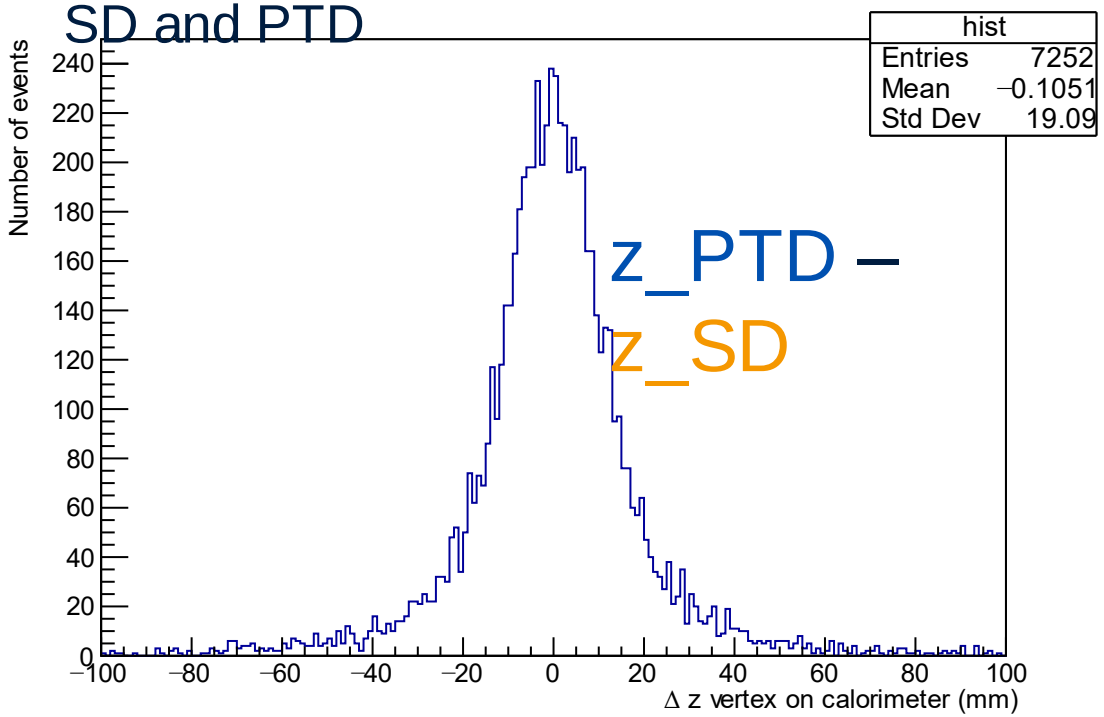
= RECONSTRUCTED

We have 3 cases :

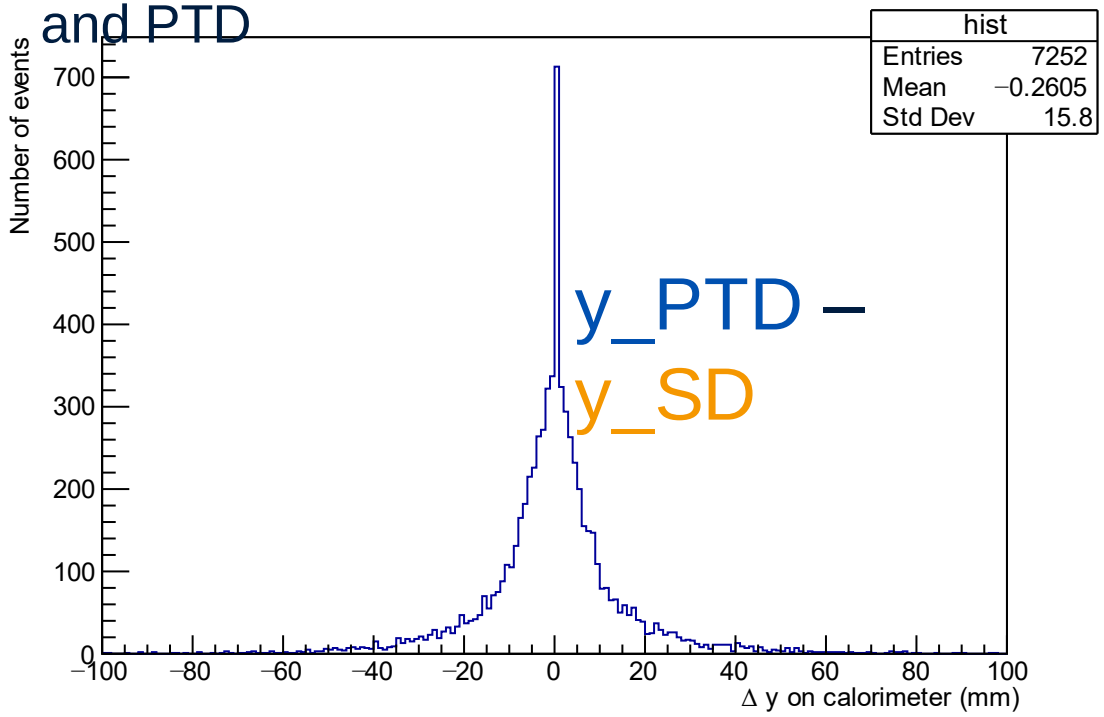
- Number electron PTD > SD → More reconstructed tracks than simulated
- Number electron PTD < SD → Some reconstructed tracks are missing
- Number electron PTD = SD → We can compare distribution

Vertex distribution on calorimeter

Delta z vertex on calorimeter between SD and PTD

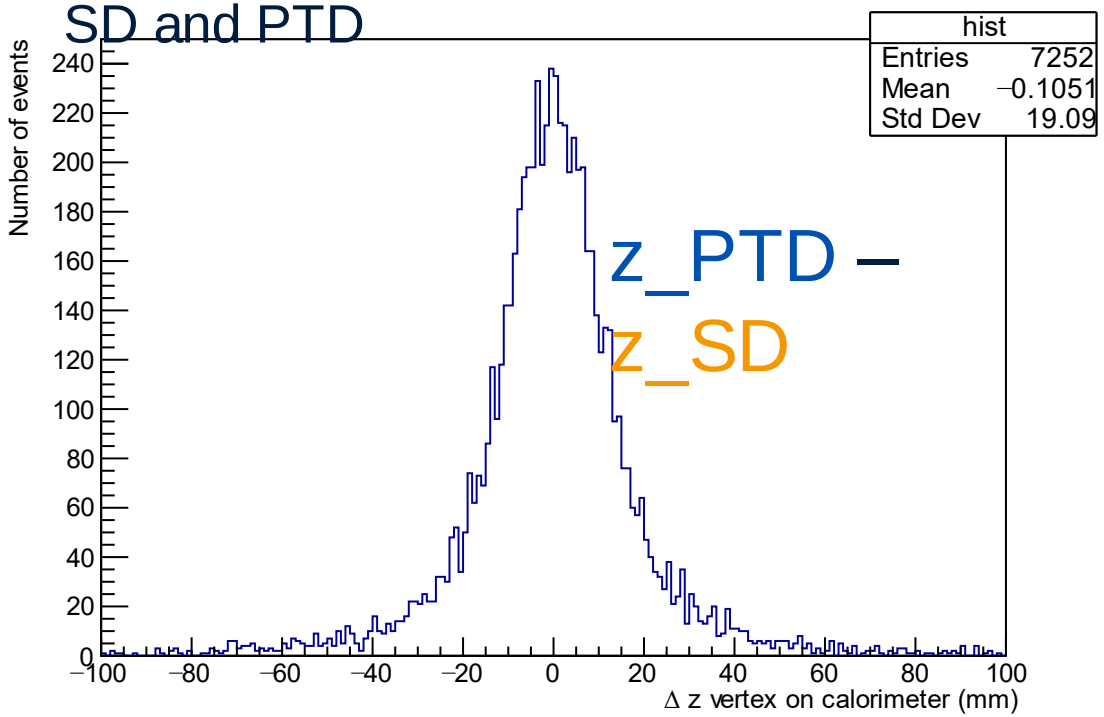


Delta y vertex on calorimeter between SD and PTD

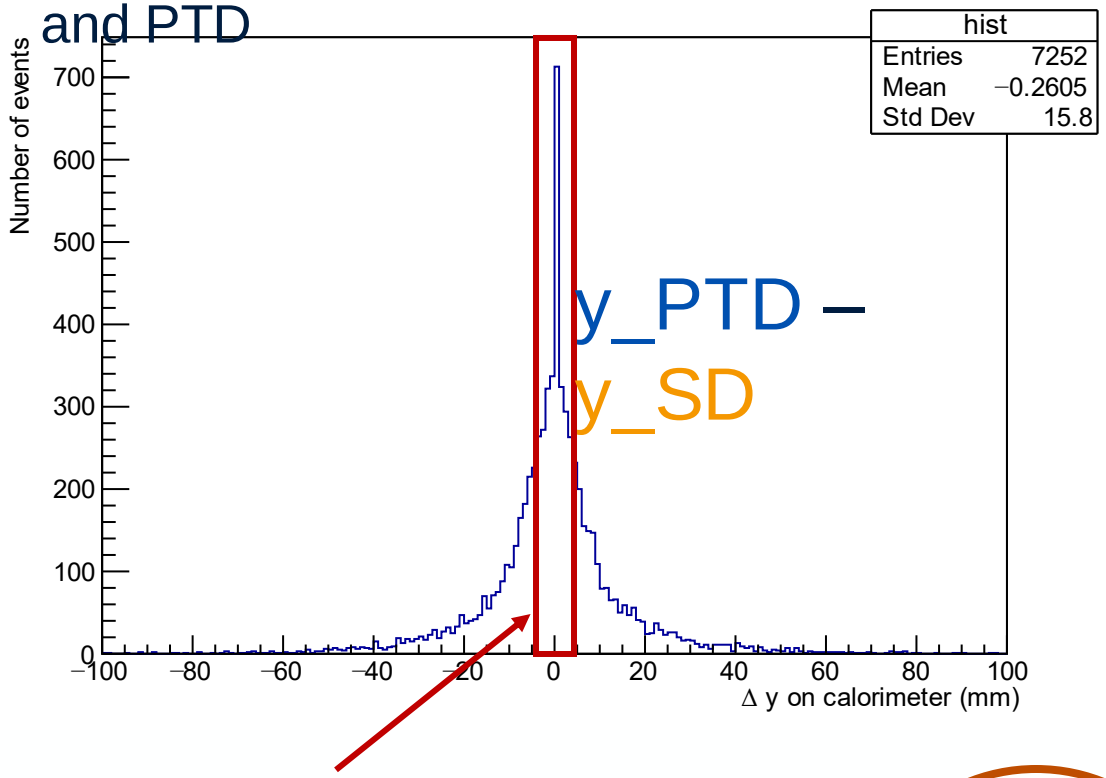


Vertex distribution on calorimeter

Delta z vertex on calorimeter between SD and PTD



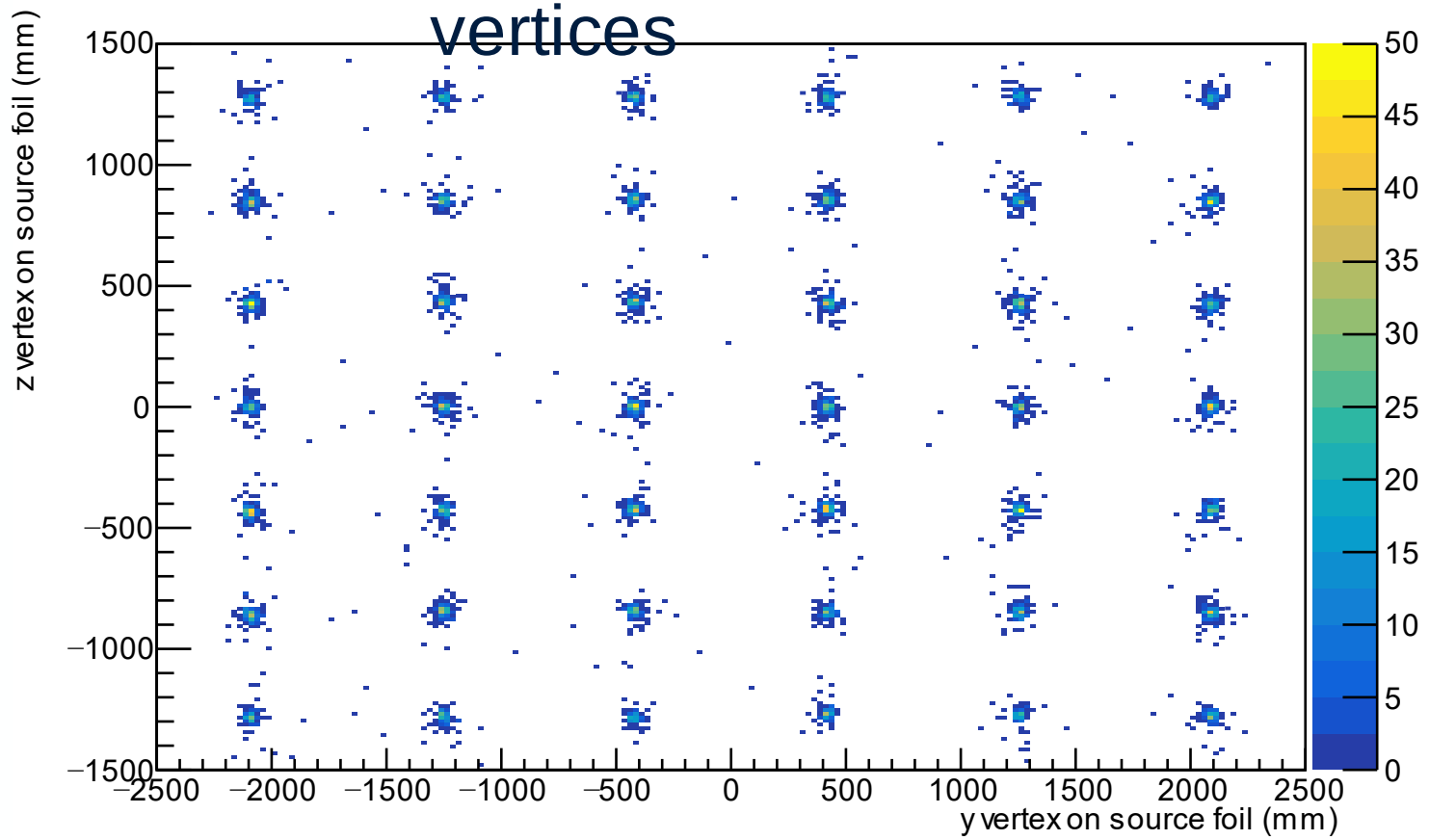
Delta y vertex on calorimeter between SD and PTD



Vertex on X_wall have the same y !

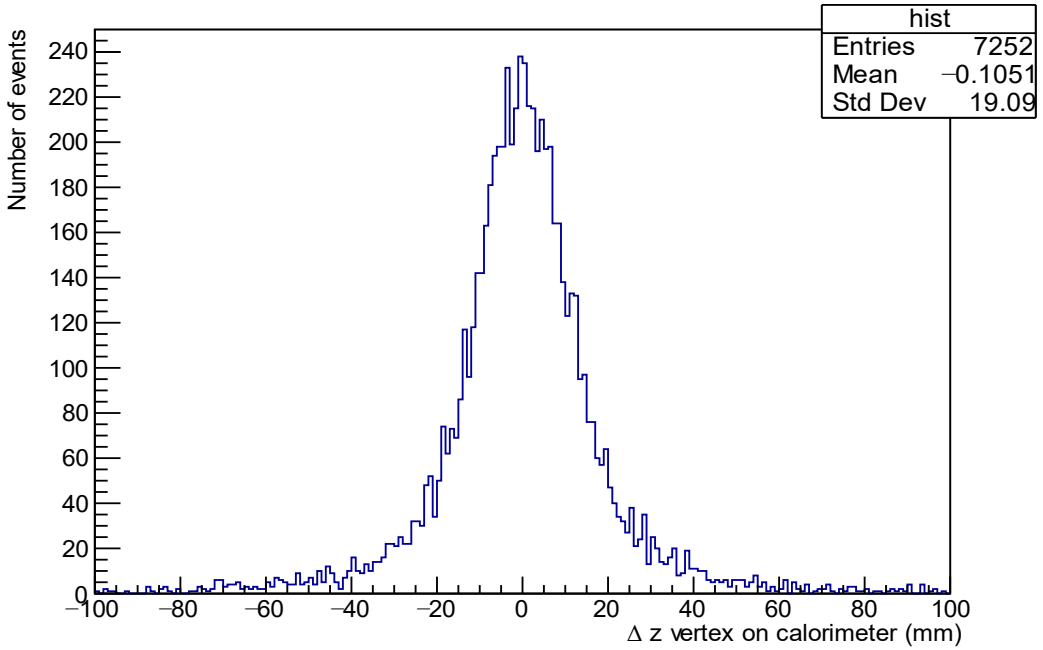
Vertex distribution on source foil

Calibration source vertices



Vertex distribution on source foil

Delta z vertex on source foil between SD and PTD



Delta y vertex on source foil between SD and PTD