

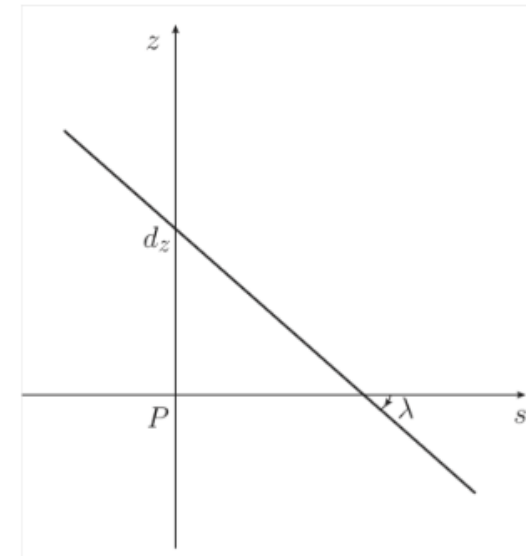
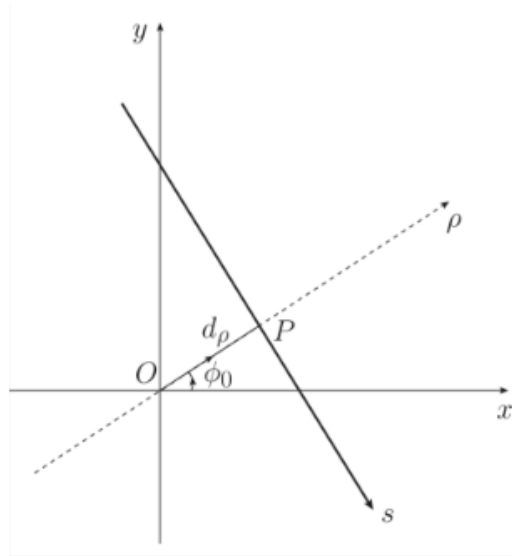
Straight Line Fit

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Introuduciton

- Straight line model
 $l(d\rho, \phi_0, d_z, tg\lambda)$



- Minimization method

i : number of clusters

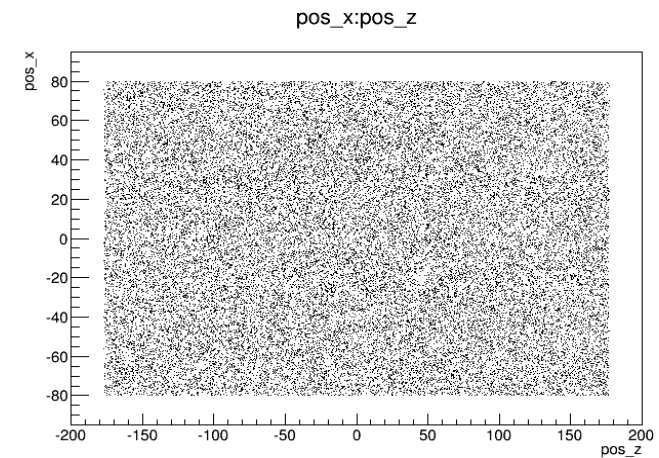
$\sigma^{X/V}$: resolution of X/V

$$\chi_{tot}^2 = \sum_i \left(\left(\frac{X_i^{meas} - X_i(L)}{\sigma_i^X} \right)^2 + \left(\frac{V_i^{meas} - V_i(L)}{\sigma_i^V} \right)^2 \right)$$

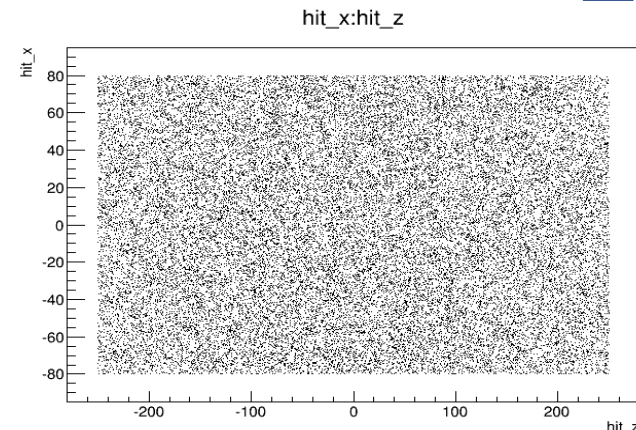
MC simulation

- 500,000 events generated. 36856 reserved.
- Clusters : Smeared MC truths with resolution $\sigma = 130 \mu\text{m}$.
- Scintillator position
W * L: 160mm*500mm .
Distance: 600 mm.
- Particle gun position on upper plane
& hit position on bottom plane.
- Particle gun:
 - $|\cos\theta| > 0.6$
 - $\phi \in (-2.5, -0.5)$

Upper
plane



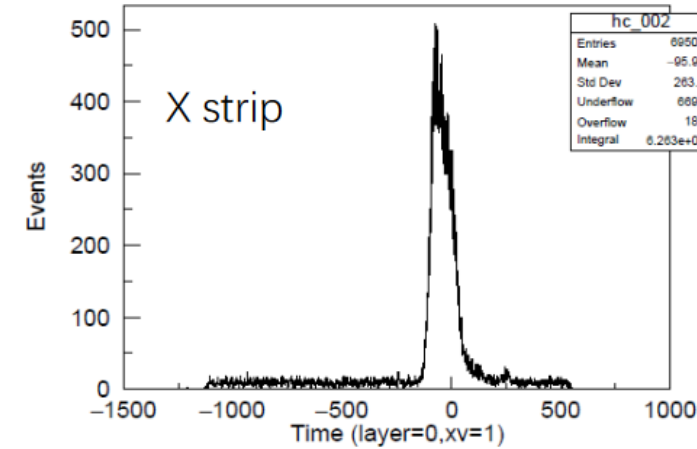
Bottom
plane



Limited by
G4,
Just reach
180 mm.

Selection criteria

- Requirements of strips :
time: (-180,100)
charge: $Q > 0$
- X-V clusters:



	run1	run2	run3	run4	run5
At least one	30350	31604	28327	44072	18018
Only one in Layer 1	2903	4110	3700	2904	954
Only two in Layer 2	13140	10468	8526	15293	9
Three sheets	6713	12289	12225	22377	2

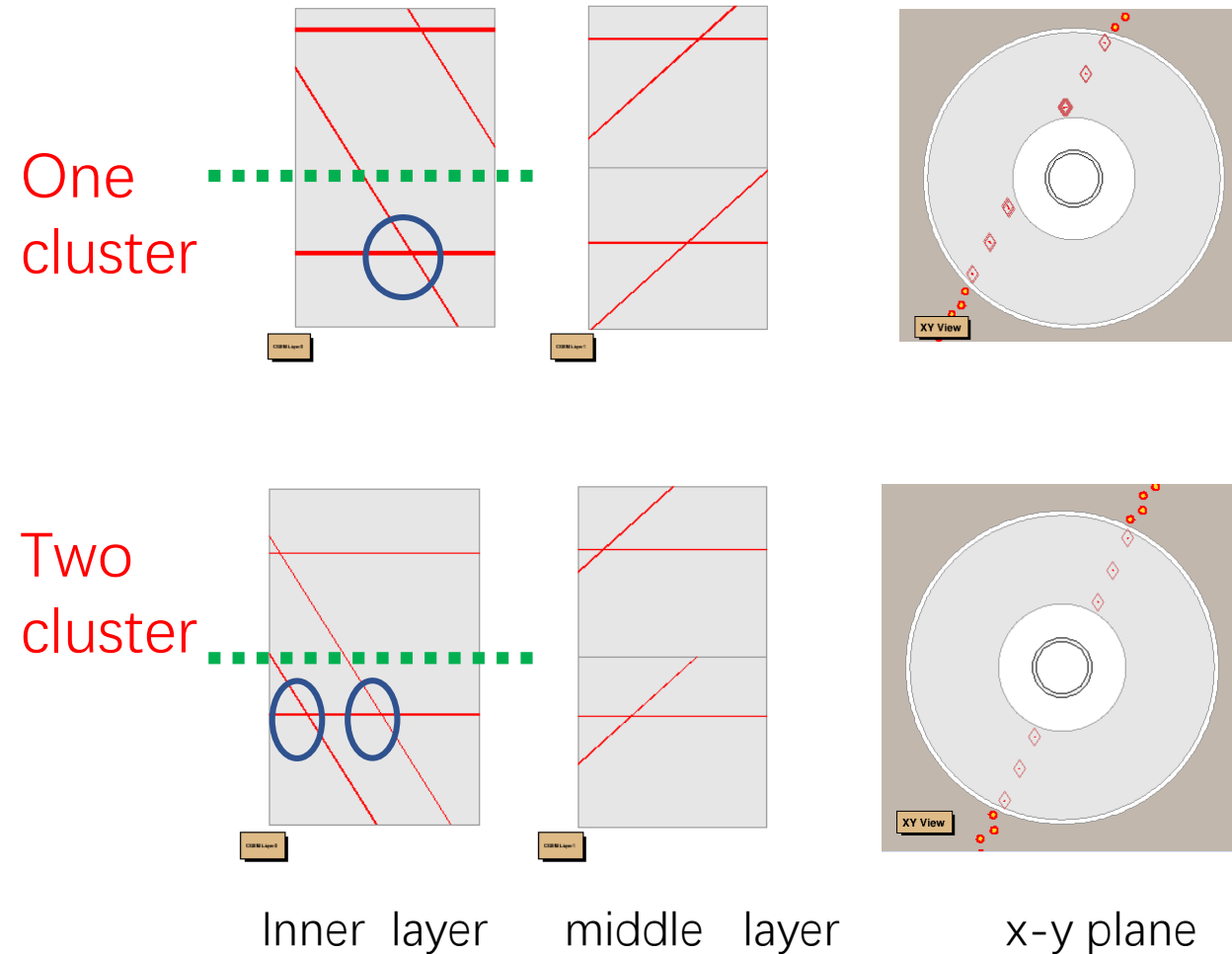
Strategy

- Data: choose the cluster with largest Q.

- MC: ~50% events has two xv-cluster in inner layer($\phi > 0$).

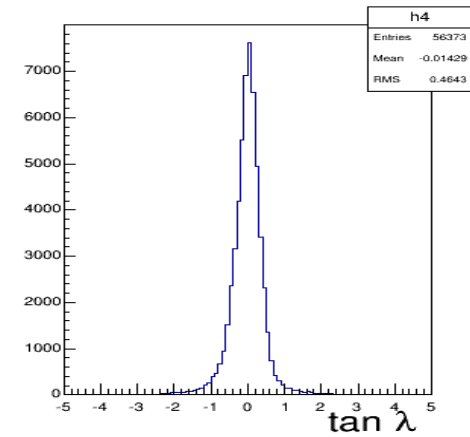
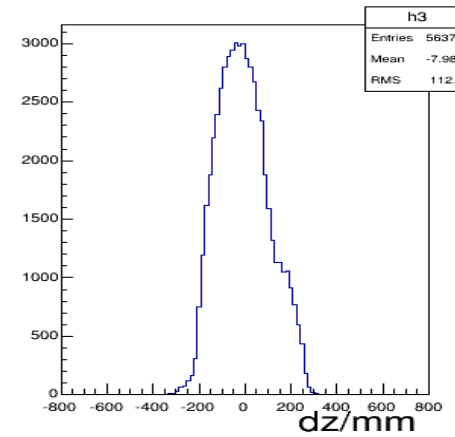
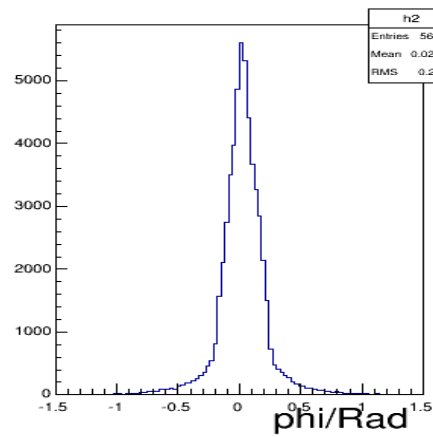
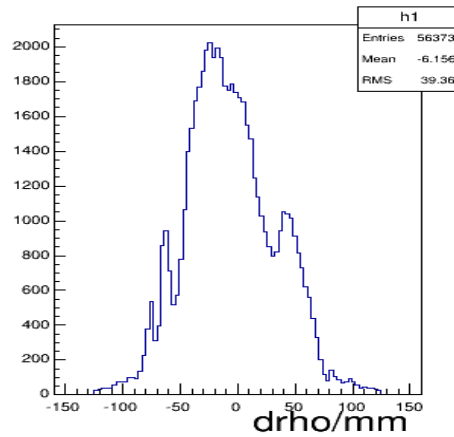
Discard one by the line linked between clusters in middle layer.

- Just use 3 clusters in fit.

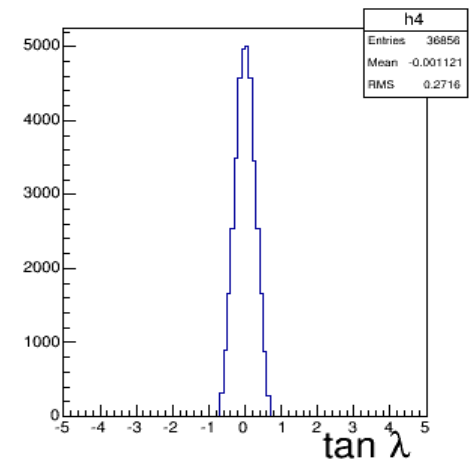
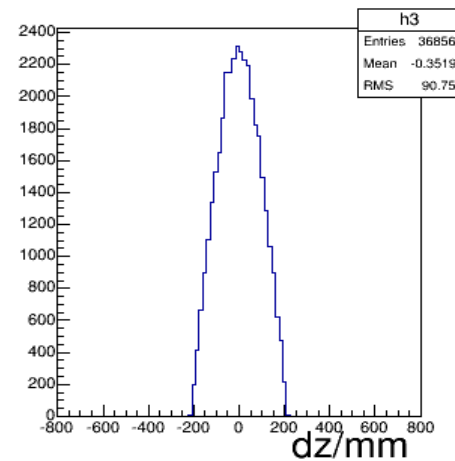
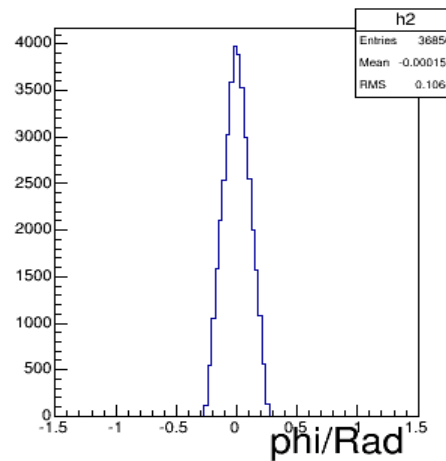
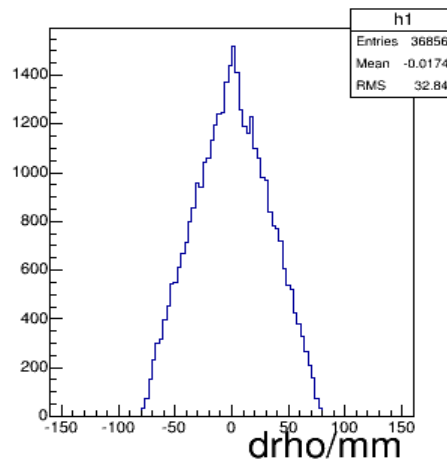


Straight Line Fit by CC clusters

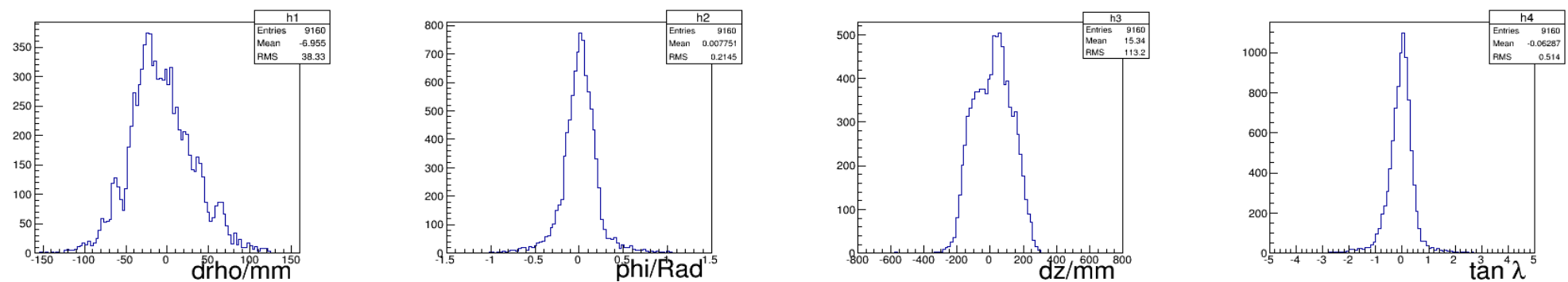
Data_cc
Run1-4



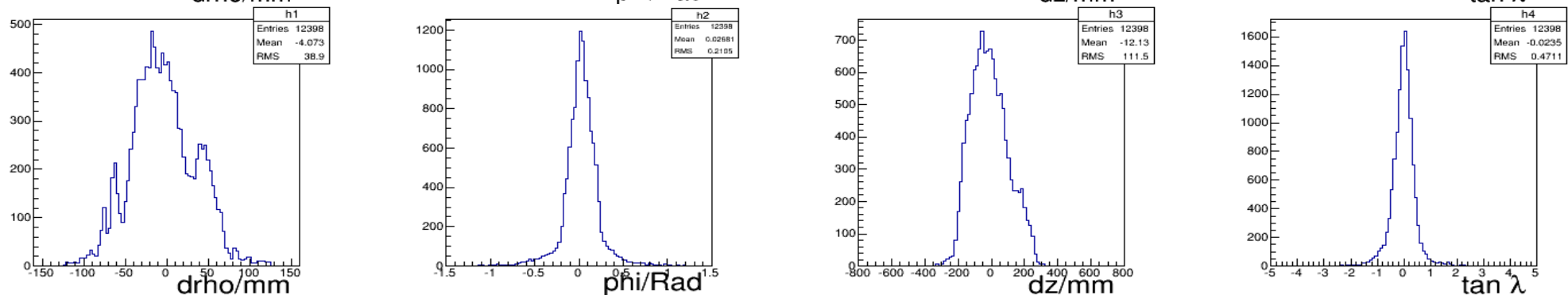
MC



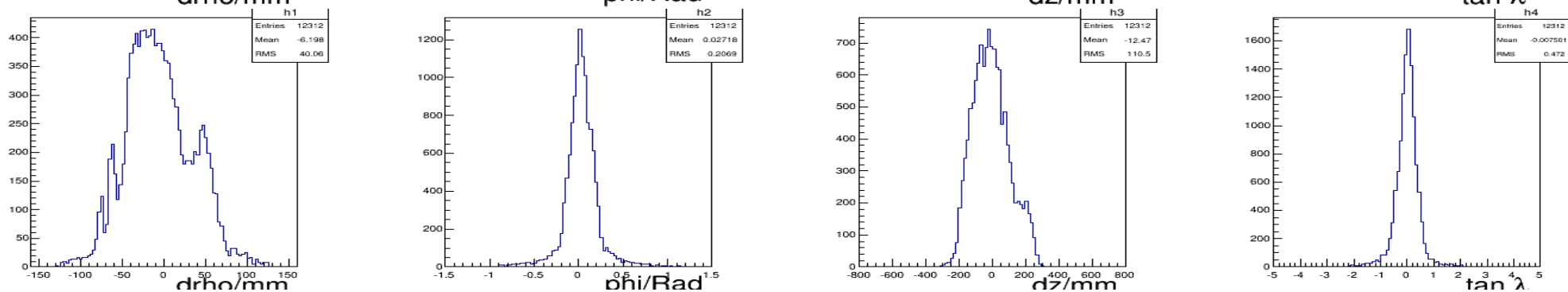
Data_cc
Run1



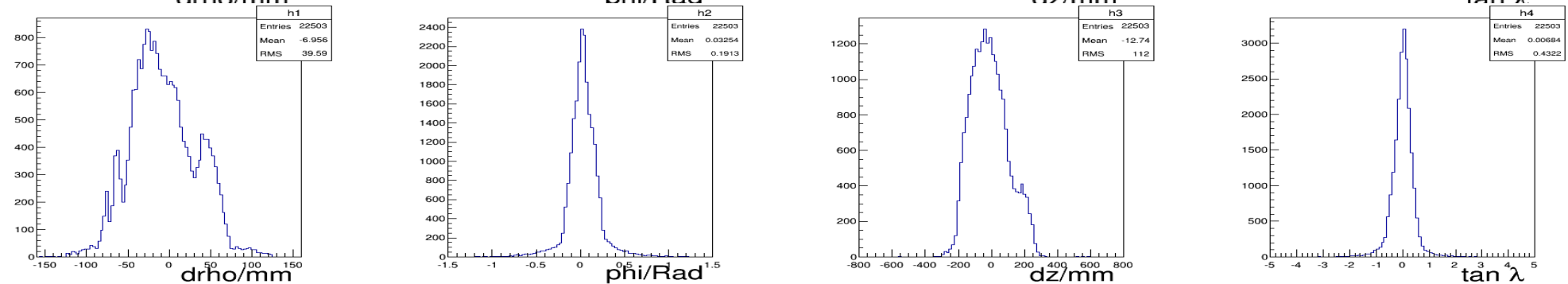
Run2



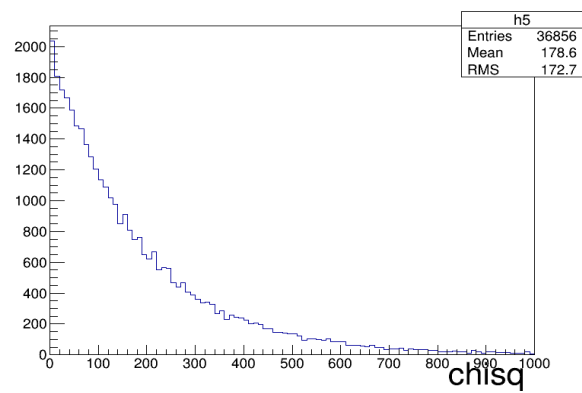
Run3



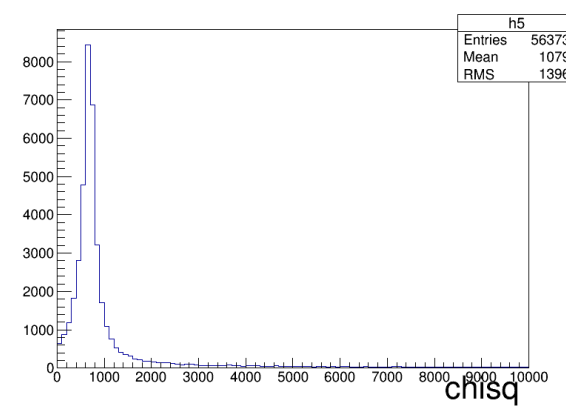
Run4



χ^2



MC



Data

Offset effect

- Link line between clusters in middle layer , and calculate the cluster in inner layer.
- $\Delta phi = phi_{real} - phi_{cal}$

