

# Preshower/Shower Calibration

Two Parts:

- 1) Event Selection
- 2) Fumili Minimization

“Good events” are chosen based on the following cuts:

1)  $R\_vdc\_u1\_nclust==1 \&\& R\_vdc\_v1\_nclust==1 \&\& R\_vdc\_u2\_nclust==1 \&\& R\_vdc\_v2\_nclust==1$

Only one track is reconstructed by the VDC

2)  $R\_cer\_asum\_c > 200 \&\& R\_cer\_asum\_c < 3000$

Cuts out the single photoelectron peak

3)  $R\_tr\_n==1 \&\& fabs(R\_gold\_th) < 0.5 \&\& fabs(R\_gold\_ph) < 0.5 \&\& fabs(R\_gold\_dp) < 1$

Compares the momentum of the particle track to that of the golden track

4)  $nBlockShower < 61 \&\& nBlockShower > 17$

$nBlockShower \neq 30, 31, 32, 46, 47, 48$

No cluster information in the edge blocks of shower

Fumili Minimization is used to compute the Energy Calibration Coefficients

$$\chi^2 = \sum_{i=1}^n [ \sum C_j \cdot (A_j^i - P_j) + \sum C_k \cdot (A_k^i - P_k) - P_{kin}^i ]^2$$

$C_{j,k}$ : calibration constants (123 total)

$A_{j,k}$ : amplitude value in the  $j^{\text{th}}$  ( $k^{\text{th}}$ ) preshower(shower)

$P_{j,k}$ : mean value of pedestals for the  $j^{\text{th}}$  ( $k^{\text{th}}$ ) preshower(shower)

$P_{kin}$ : particle momentum

To check calibration: plot  $E_{tot}/p$

