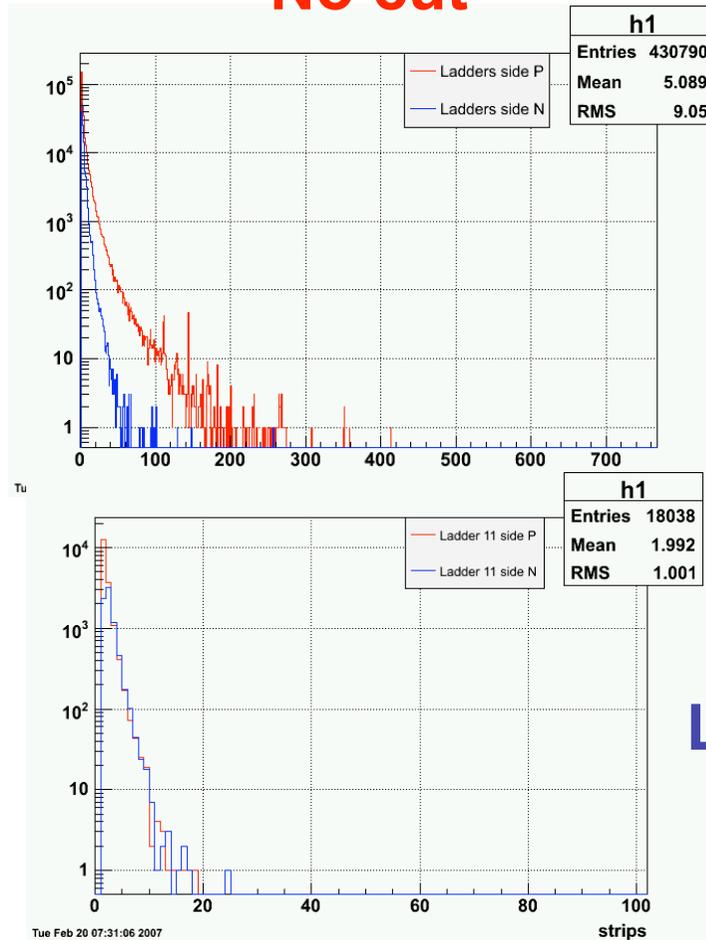


Updates

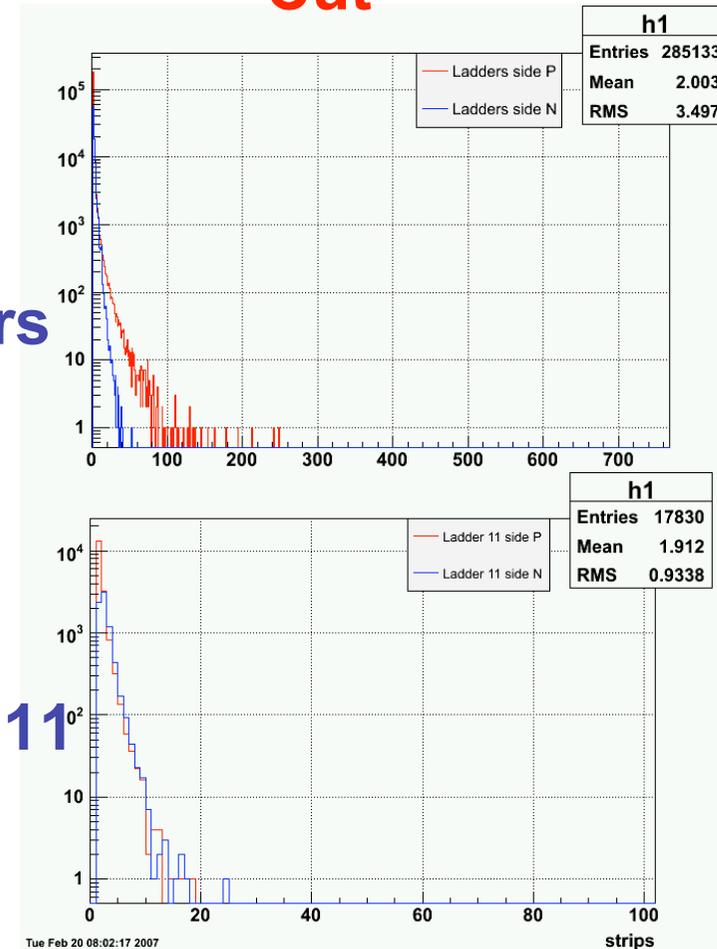
- ClusterFinder :
 - Cut on strips to reduce the size of the clusters.
- PointMaker :
 - Remove the fake hits that have been stored in the SsdHitCollection.
 - Improvement on the calculation of the position of the hits.

Cut on the neighboring strips

No cut



Cut



- Cuts used : $CUT_{seed} = 5\sigma$
 $CUT_{neighbouring} = 2\sigma$
- Reduce the clusters width.
- Individual ladder behaviour (Ladder 11 already good without these changes).

Some numbers (from cucu200)

Ratio	sideP	Side N
default	24%	13%
With cuts	4.3%	5,5%

$$Ratio = \frac{NbOfClusters(size \geq 5strips)}{AllClusters}$$

- Reduce the number of large clusters.
- Help for the calculation of the reconstruction point (next slide)

Cluster Finding algorithm

- Digital (position finding algorithm) : for cluster width = 1 strip :
 - the position of the cluster is the strip id.

- Center of gravity (COG)
for cluster width more 1 strips

$$x_{COG} = \frac{\sum_i Q_i x_i}{\sum_i Q_i}$$

- Non-linear η [2]
Define for cluster width = 2 strips

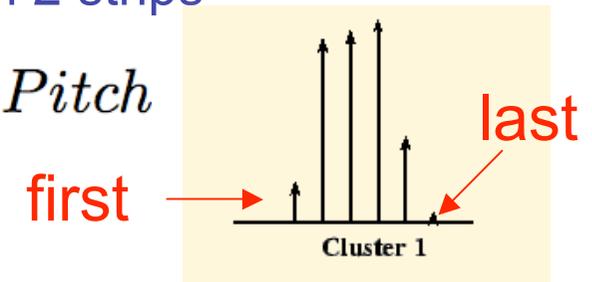
$$x_\eta = x_L + Pitch \times f(\eta)$$

$$\eta = \frac{Q_R}{Q_R + Q_L} \quad f(\eta) = \frac{\int_0^\eta \frac{dN}{d\eta'} d\eta'}{\int_0^1 \frac{dN}{d\eta'} d\eta'}$$

$Q_{R/L}$: charge of the right(left) strip in the cluster

- Analog Head&Tail : for cluster width more than 2 strips

$$x = \frac{x_{first} + x_{last}}{2} + \left(\frac{Q_{first} - Q_{last}}{Q_{ave}} \right) \times Pitch$$



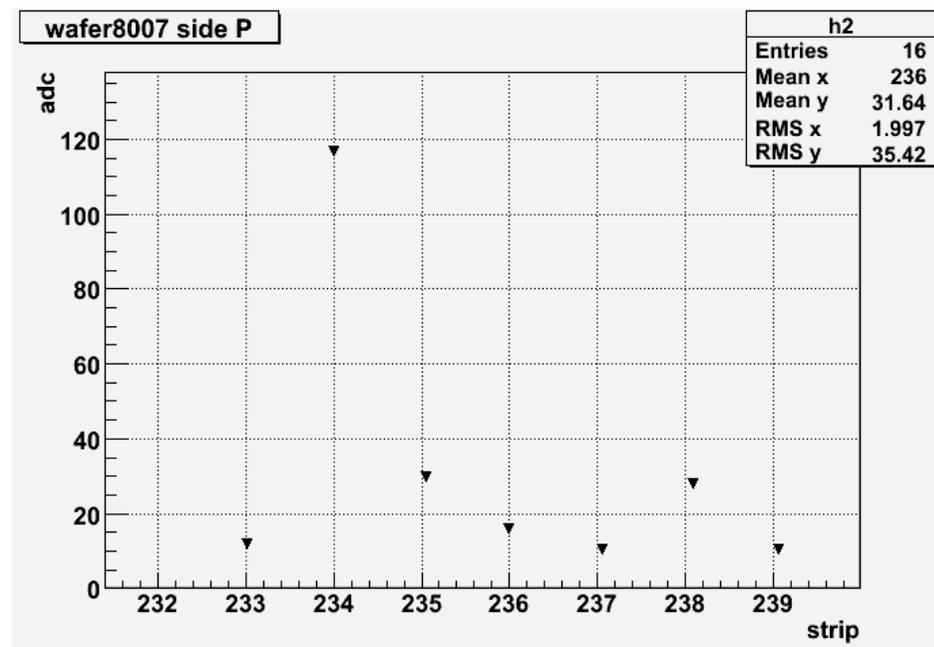
Example

- Actually only the COG algorithm is used for the determination of the position of the reconstructed hit from the clusters.
- In case of clusters with tail (see figure at the right, that shows the adc of strips in 1 cluster), the COG lead to :

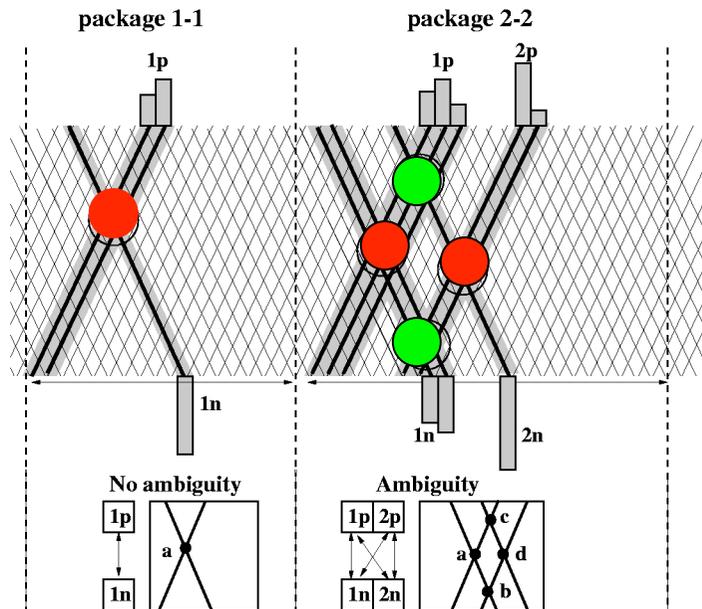
$$X_{\text{COG}} = 235,18$$

(it represent the strip mean of the cluster, one has after to convert it into global coordinate).

- In this case we can expect a strip mean near than strip = 243 according to its adc value.
- η algorithm is used to give better results for cluster size = 2 strips, which is not a negligible case here.



Hit Reconstruction



- In case of geometrical overlapping, the association between clusters on side P and N side lead to ambiguous hits.
- Charge correlation is used to solved ambiguities.

No ambiguity

Ambiguities

- One error found in the soft : we actually stored all the possibilities, even the ghosts hits.
- The `ssdHitcollection` has a 'flag' member that is not used now.
- The flag is the probability of each configuration.
- Can use this in the future.