OVERVIEW OF THE WORK

TileCal Valencia Meeting

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Motivation

The current optimization of topo-clusters (4,2,0) was obtained with MC and it has to revised **with real data**.

WHY?

NOISE UNCERTAINTY!!

Since all thresholds for topological clustering are relative to the expected amount of noise, both from electronics and pile-up, uncertainties in these numbers have a direct effect on the reconstruction efficiency of the clustering algorithm…

Topological Clustering

- **BASIC IDEA**

  To group into clusters neighboring cells that have significant energies compared to the expected noise.

- **THE CLUSTER MAKER**

1) **Finding seeds**: Identify all cells with a signal to noise ratio above the seed threshold t_{seed} (= 4 --> $|E|/\sigma>4$).
2) **Finding neighbors**: For each seed cell, its neighboring cells compared to neighbor threshold $t_{neighbor}$ (=2).
3) **Finalize**: If the signal to noise ratio is above the cell threshold, t_{cell} (=0), but below $t_{neighbor}$, the cell is included only in the first adjacent.

MY WORK

- Make differents topo-clusters configurations from real data in the ntuple:

3	2	0	4.5	1.5	0
3.5	2	0	4.5	2.5	0
4.5	2	0	4.5	3	0
5	2	0			
5.5	2	0	5	1.5	0
6	2	0	5	2.5	0
			5	3	0
4	1.5	0			
4	2.5	0	4	2	0.5
4	3	0	4	2	1

IT'S DONE!!

- Investigate about the best topo-cluster configuration

I'M WORKING ON THIS POINT

MY WORK

Basically:

With the description of noise in MC by using (4,2,0) the impact of noise was basically negligible.

However, in MC noise is simulated with a single Gaussian and indeed we have two contributions:

electronics + pile-up

Study the impact of noise to MET with data and compare with MC