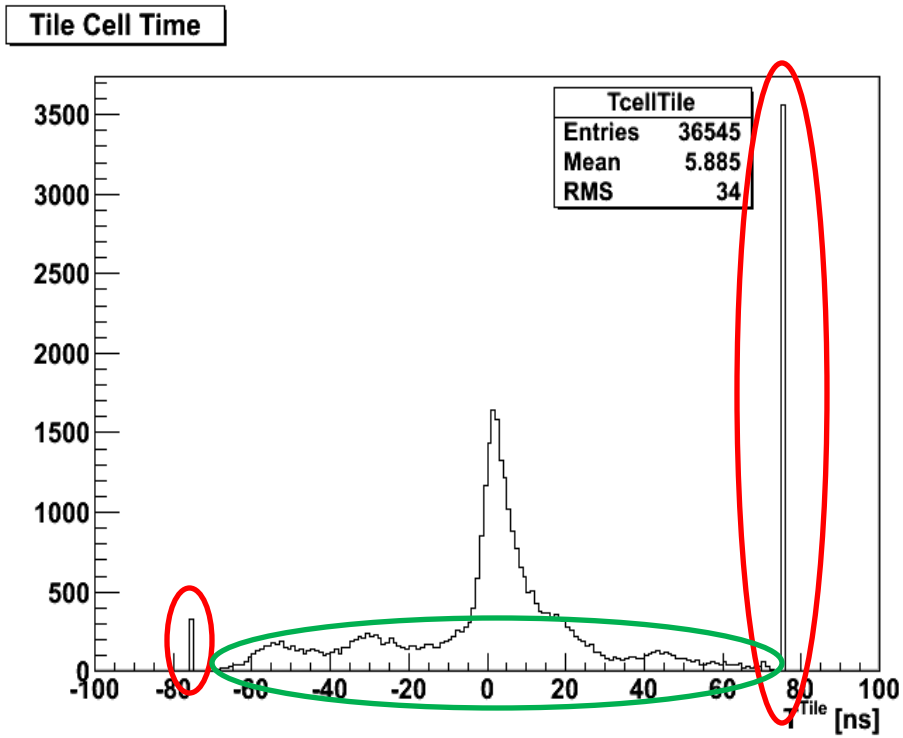
Tile timing using cells and topoclusters for collision data.

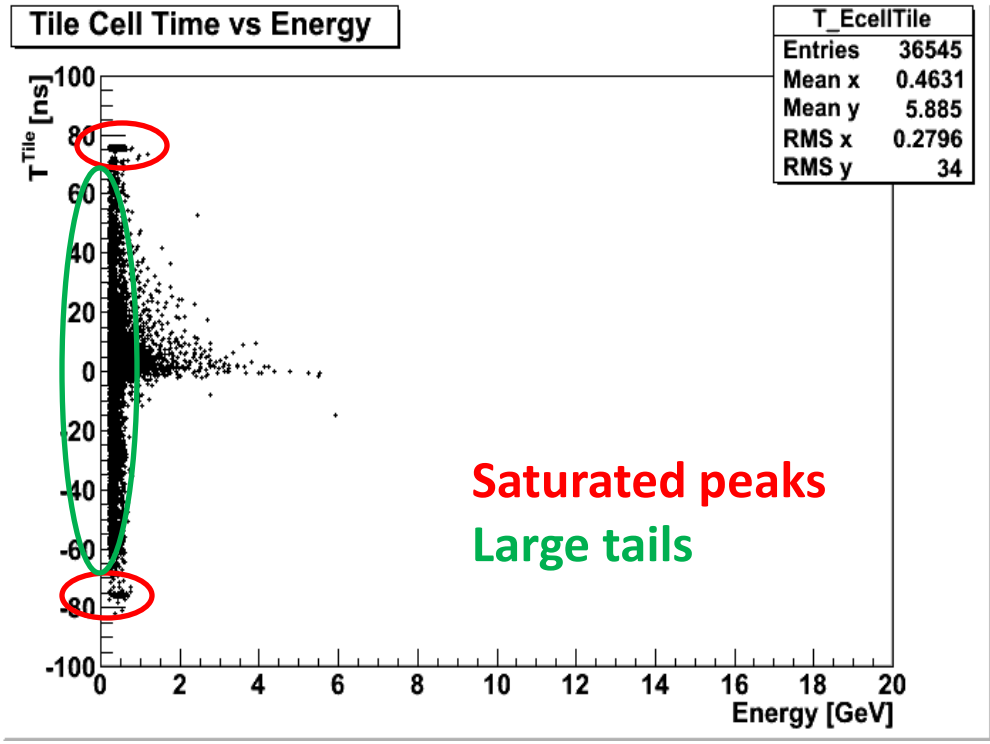
Yesenia Hernández Jiménez

IFIC - University of Valencia

TILE CELLS. SUMMARY

Tile cells Timing for collision events



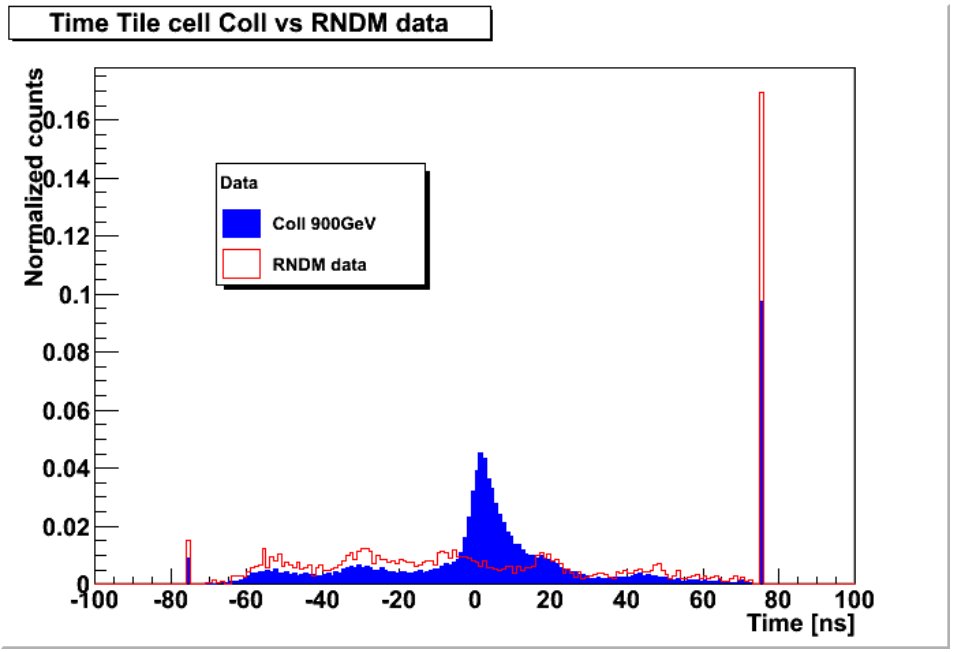


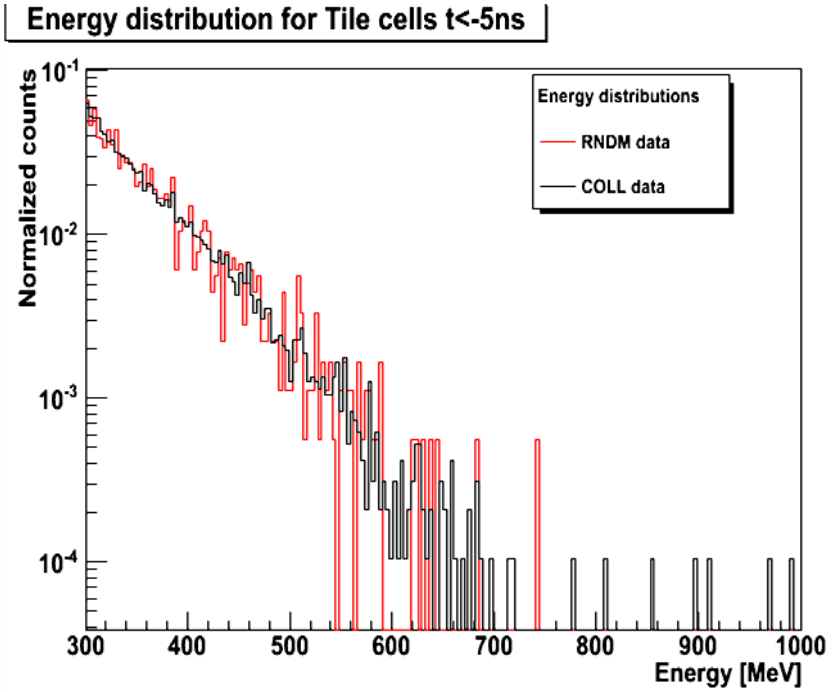
CUTS:
- MBTS: |Time_SideA - Time_SideC|<7.5 ns
- Ecell > 300 MeV
- |Ediff/Ecell| < 20%

In the distributions we have:
Data + noise (E<1GeV)

Noisy cells pass the cuts

Tile cells Timing for collision events. RNDM data + COLLISION data.





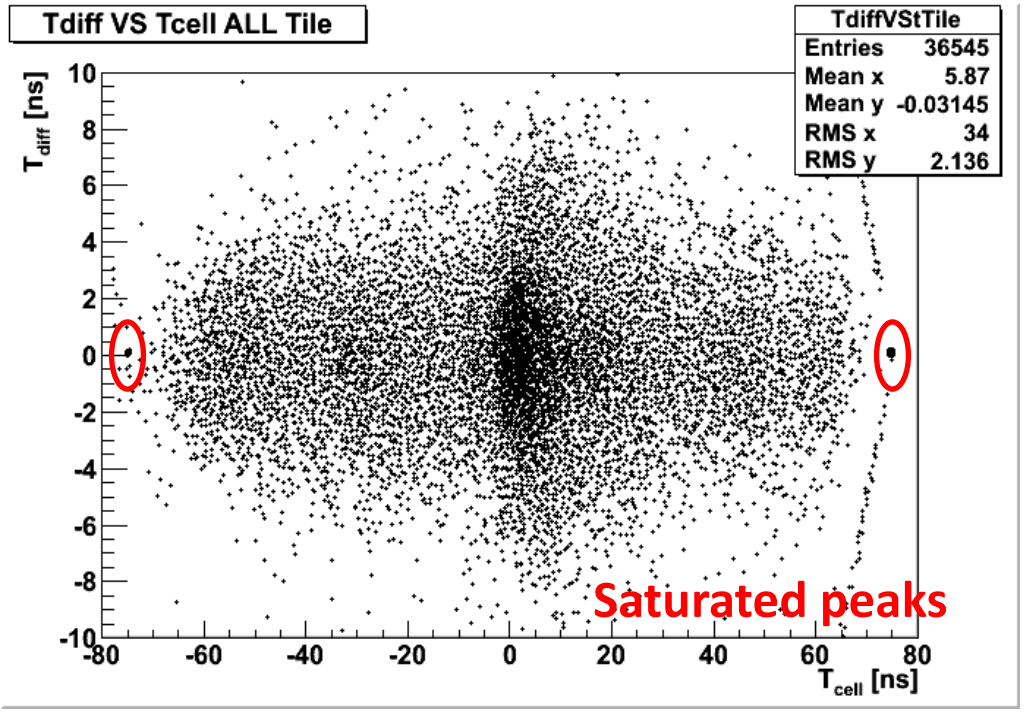
Energetic cuts:

- Ecell > 300 MeV
- |Ediff/Etot| < 20 % -> Shows that the noise is coherent!

are **not enough to remove** completly **noisy cells** in **collisions data**.

Energy distribution for Tile cells with t < -5 ns in collision and RNDM data

Tile cells Timing for collision events. SATURATED PEAKS.



Recall:
Tcell = (Tpmt1 + Tpmt2) /2
Tdiff = (Tpmt1 – Tpmt2)/2

Saturated peaks are formed by cells with:

1) |Tcell | == 75 ns

2) Tdiff == 0 ns

both pmts are saturated in time

3) Their energies are similar:

Ecell > 300 MeV
|Ediff/Ecell| < 20%

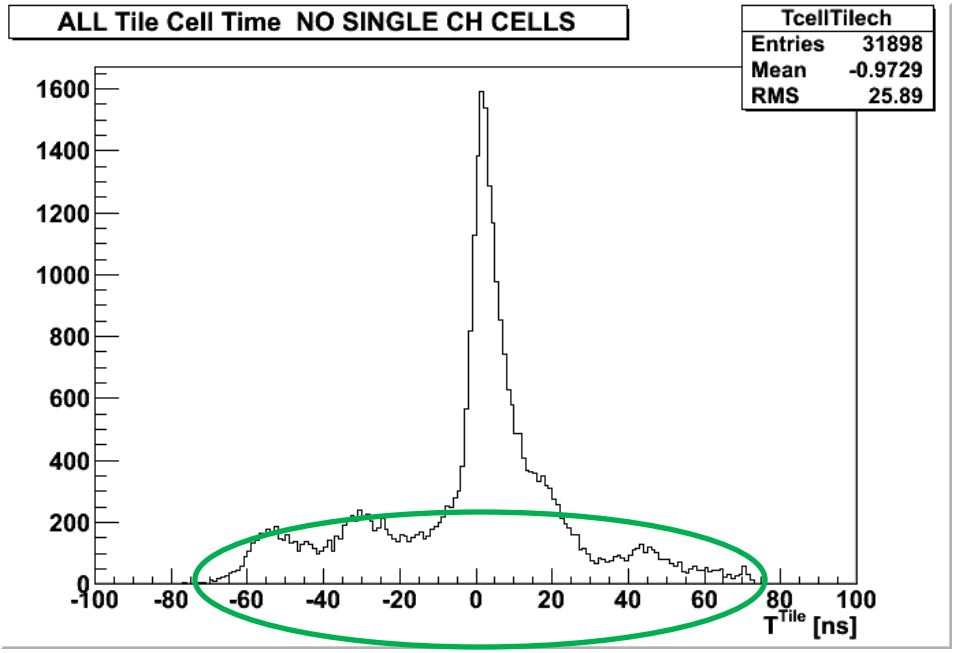
→

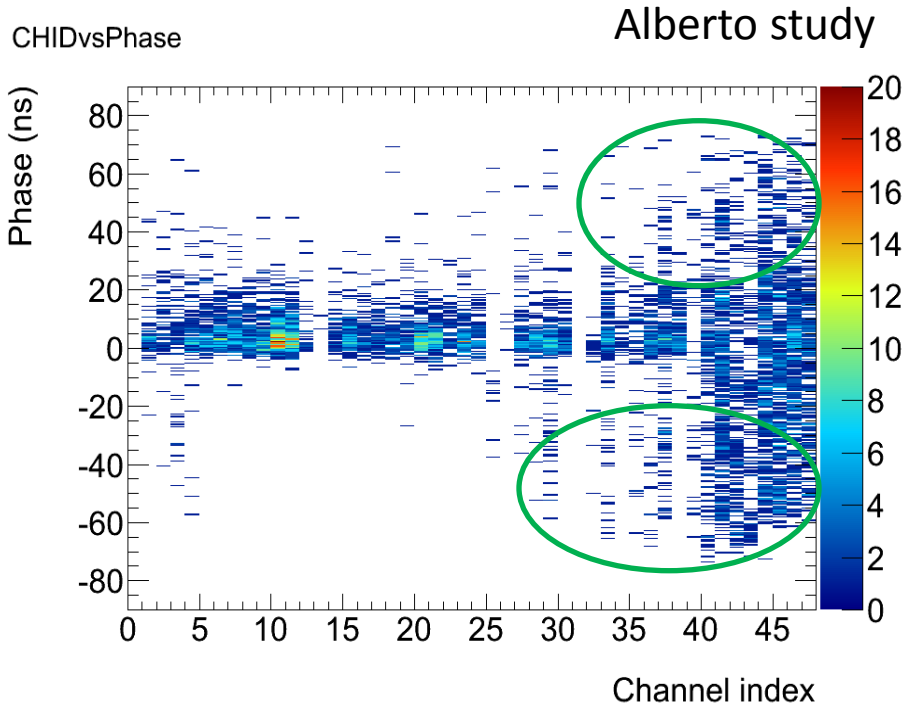
Recall:
Ecell = Epmt1 + Epmt2
Ediff = Epmt1 – Epmt2

→

Epmt1 Є [180, 1000] MeV
Epmt2 Є [120, 1000] MeV

Tile cells Timing for collision events. LARGE TAILS.



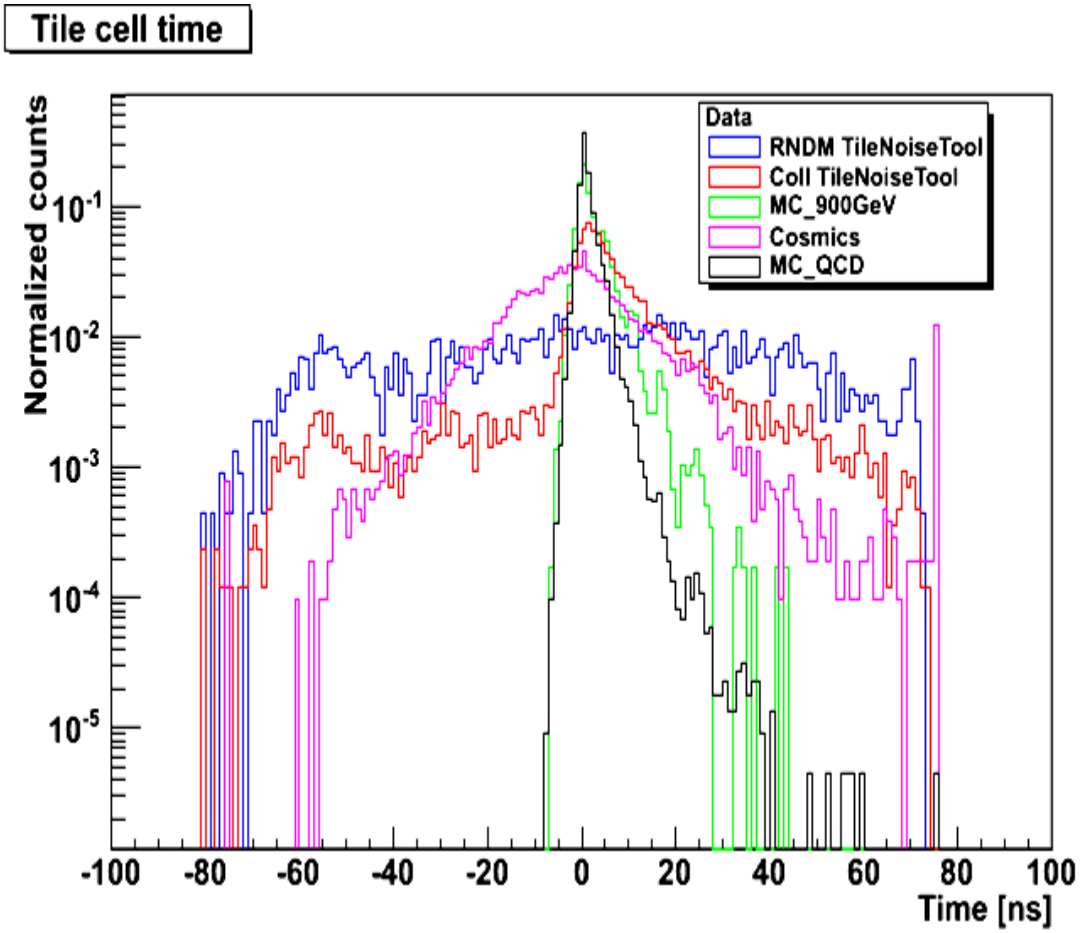


Noisy cells which produce **large tails** in timing distrubution have:

1) **High time values: 20 < |t| < 70 ns**
2) Most of them have **high index channels: 35 < channel < 47**: **effect of power supply?**

In order to remove this noise contribution we apply **Ecell > 1 GeV** in following slides.

Tile cells Timing for collision events + RNDM + cosmics + MCs

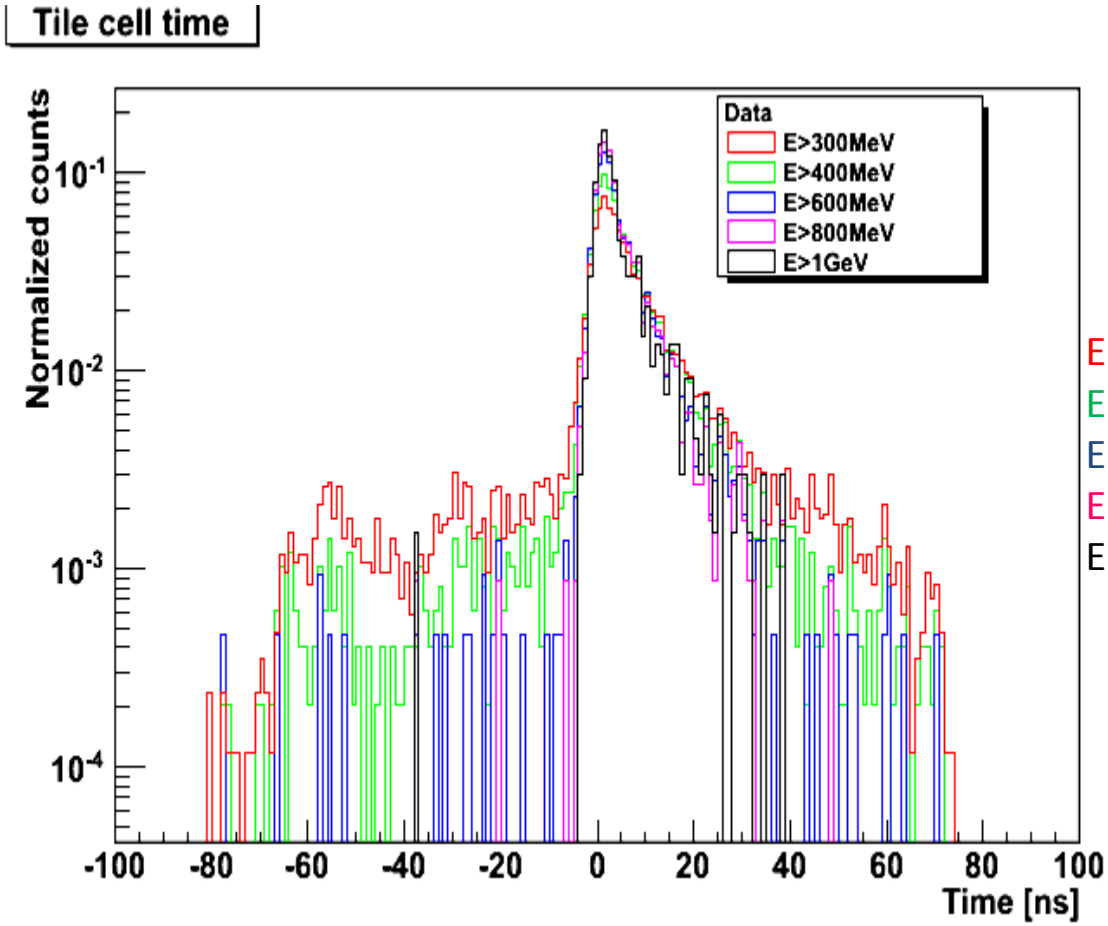


Applied cuts:

- MBTS cut: MBTS_A-MBTS_C < 7.5ns (MinBias and MC data. No in Cosmics or RNDM)
- Ecell>300MeV
- Tdiff !=0.00 ns (No saturated time (t=+-75ns) peaks)

DATA	MEAN	RMS
RNDM	1.34 ns	35 ns
COLLISION	5.01 ns	19 ns
MC_QCD	1.34 ns	2 ns
MC_900GeV	2.56 ns	4 ns
COSMICS	-1.19 ns	17

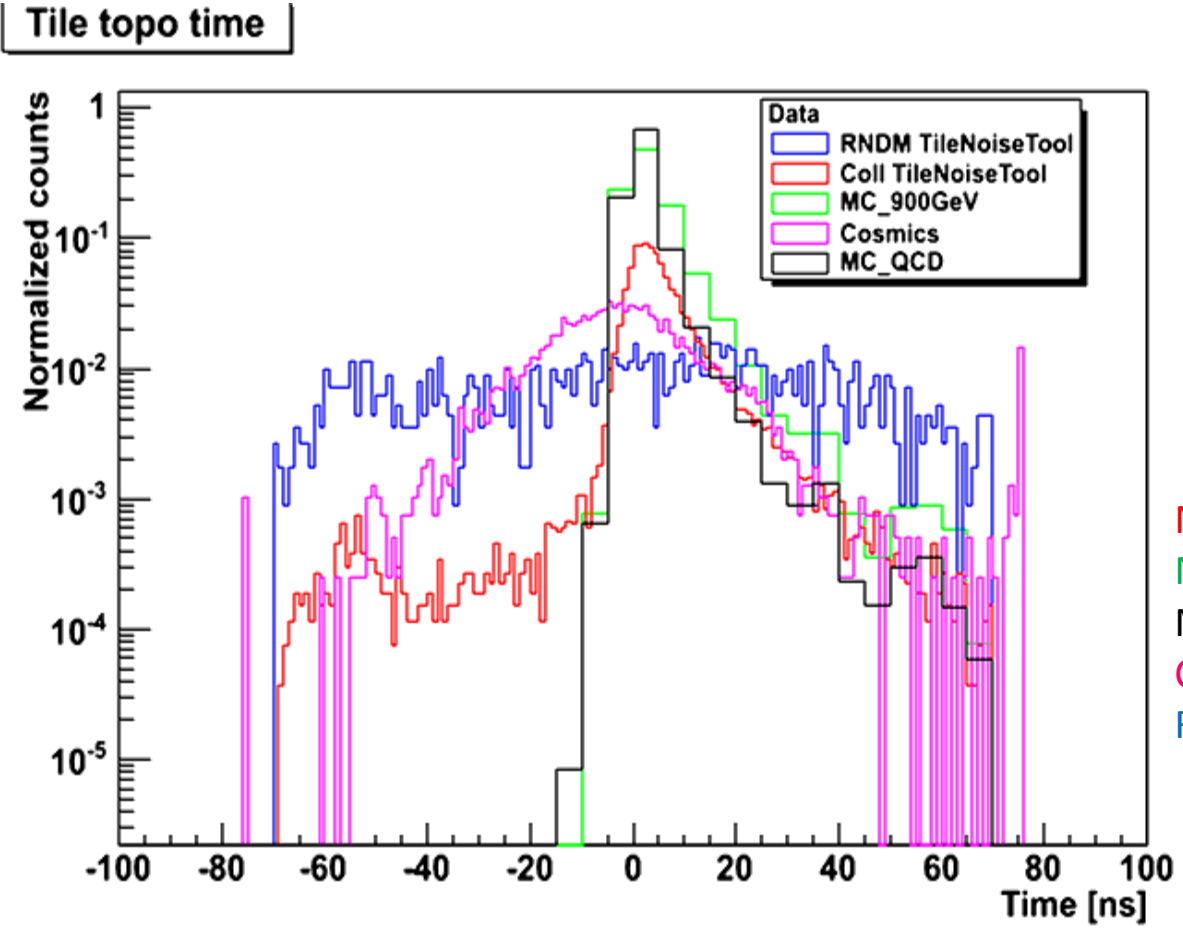
Tile cells Timing for collision events. E CUTS



E>300 MeV. MEAN= 5.01242 RMS= 19.0784
E>400 MeV. MEAN= 5.31116 RMS= 13.6185
E>600 MeV. MEAN= 5.02634 RMS= 8.69508
E>800 MeV. MEAN= 4.73775 RMS= 6.3695
E>1GeV. MEAN= 4.75009 RMS= 6.67573

TILE TOPOCLUSTERS. SUMMARY

Tile topocluster Timing for collision events. Comparisons E>1GeV



Tcluster=Sum(Tcell*Ecell^2)/Sum(Ecell^2)

Applied cuts:

MBTS cut: MBTS_A-MBTS_C < 7.5ns (MinBias and MC data. No in Cosmics or RNDM)

Ecell>300MeV

Tdiff !=0.00 ns (No saturated time (t=+-75ns) peaks)

DIFFERENT BINNING FOR MC DATA!!

MinBias data. MEAN= 5.32 RMS= 10.1

MC 900GeV. MEAN= 3.66 RMS= 6.1

MC QCD. MEAN= 1.90 RMS= 4.1

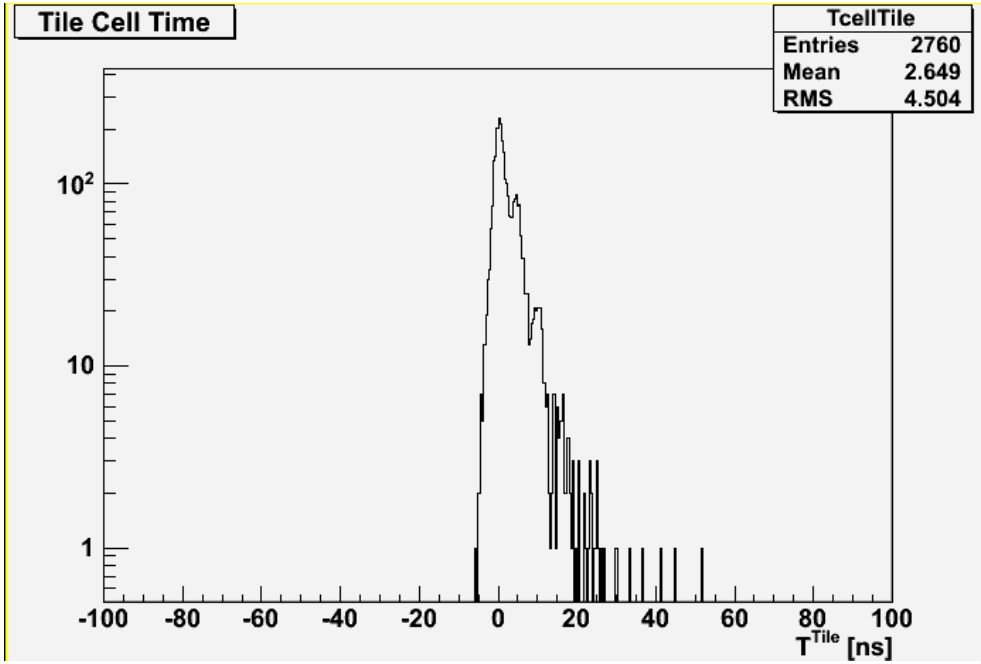
COSMICS data. MEAN= -1.19 RMS= 18.7

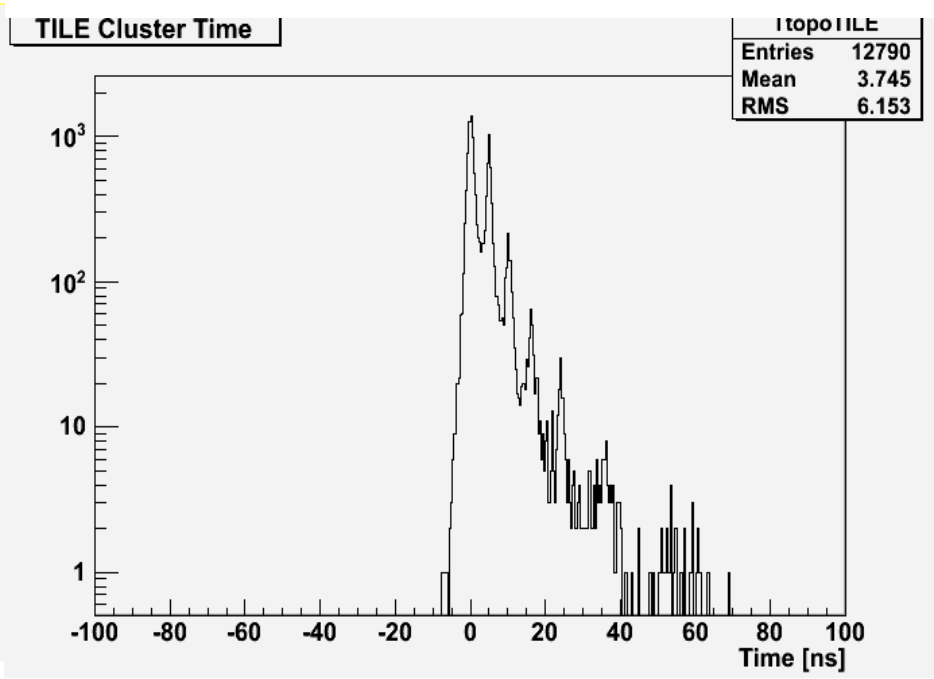
RNDM data. MEAN= 0.91 RMS= 34.1

Difference between cluster timing in coll data and MC data is around 2 ns.

SIMULATION PROBLEM IN TIMING DISTRIBUTION

Timing distributions for MC simulation 900GeV. New time granularity.

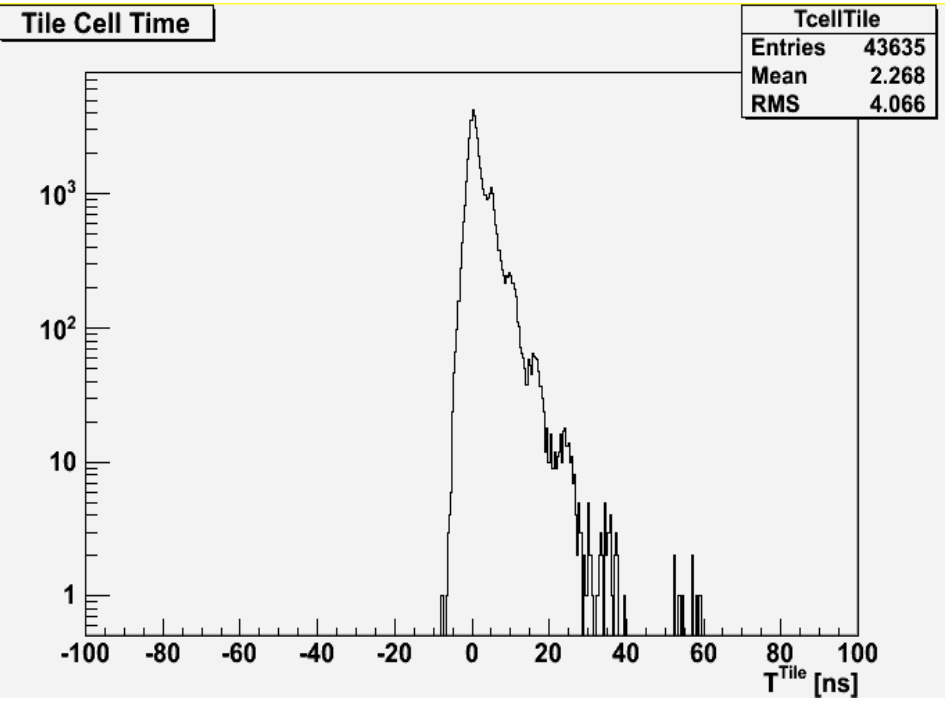


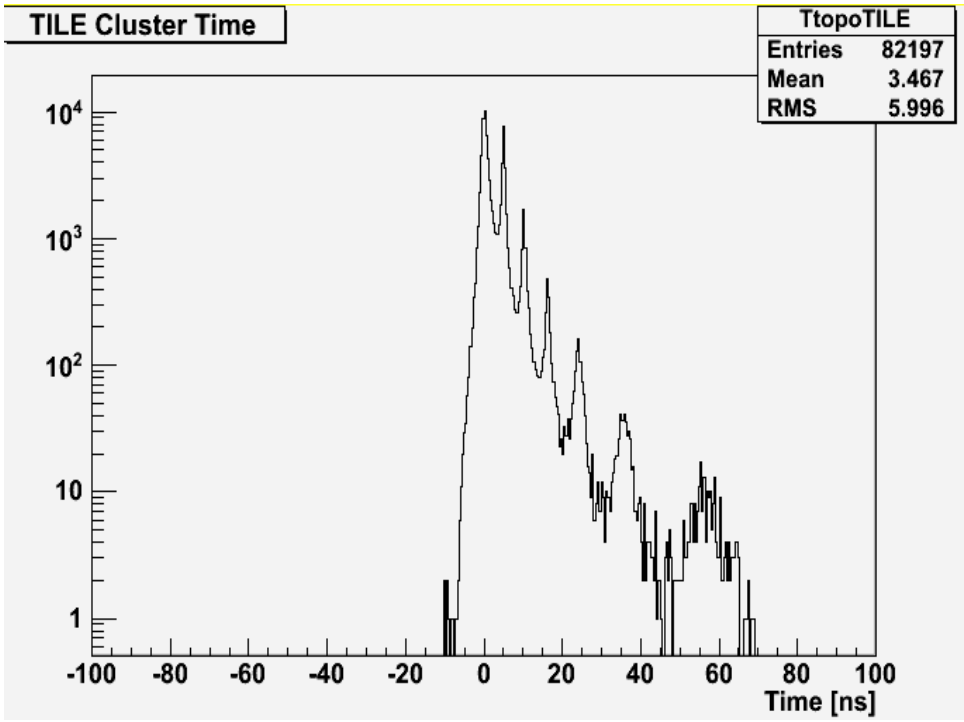


Fine time granularity in simulation (0.5 ns) -> MC distributions show peaks.

Timing distributions for MC simulation 7TeV. New time granularity.

Official Tile ntuples:
https://twiki.cern.ch/twiki/bin/view/Atlas/Tile2010Collisions#MonteCarlo





Tomorrow we will compare these time distributions with collisions data at 7TeV.

CaloCellNoise update for MC: Shasa's mail -> 'cell noise update was wrong for MC , now we put correct values'.

JETS

Timing study using Jets

Yingchun and me are producing jet variables in the ntuples.
Yingchun: Collision data 900GeV
Me: MC_900GeV

Jet algorithm -> Antikt4H1topojets

I expect the same problem with timing distributions for MC production data…

I'm working on:

Find cells information inside jets with navigator tool.

Extrapolate tracks to Calo objects: CaloTrack package.

CONTRIBUTION WW GROUP

Next WW study

Use D3PDs to study transverse mass for the electron in MC vs COLLISION data.

Our goal:
Study background of fake electrons in collision data.

USING GRID AT IFIC. GANGA

Using GRID at IFIC. GANGA

We want to produce our ntuples for DSP study using GRID at IFIC.

Main problem:
We need to change our jobO to run in the GRID -> We read RDO files with BytestreamInputSvc funtion but it is not available in GANGA…

Elena Oliver (GANGA expert at IFIC) and me are working on this point.