

Test beam analysis update

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17/11/2014

Data on the grid

- Thanks to Andre the data from test beam is on the grid!
- I upload 3 files :
 1. /ilc/fcal/tb2014/telescope_data.tar.gz
 2. /ilc/fcal/tb2014/lumical_data.tar.gz
 3. /ilc/fcal/tb2014/trunc_lumihal.tar.gz
- All files are at DESY-SRM, CERN-SRM, TAU-SRM.
- Sasha's test beam photo can be found at :
http://alzt.tau.ac.il/~aborysov/beamtest_2014/

How to access

- You should get a grid certificate (in case you don't have...) from your home institute. Some information is at : <http://grid.desy.de/certs/>
- You should join the ILC virtual organization (VO) from : http://grid.desy.de/desy_vo.html
- Register in ilcdircac.
- detailed instruction can be found here : <https://twiki.cern.ch/twiki/bin/view/CLIC/IlcdircacRegistration>
- After all of this you need to :
 1. Source dirac environment
(at lxplus : `$>source /afs/cern.ch/eng/clic/software/DIRAC/bashrc`)
 2. Get dirac proxy
(`$>dirac-proxy-init -g fcal_prod or ilc_user`)
 3. Get the file :
`$> dirac-dms-get-file /ilc/fcal/tb2014/....`

More information on ilcdircac :

[ILCDIRAC for users](#)

[DIRAC Tutorials](#)

[DataManagement](#)

Converting the raw data

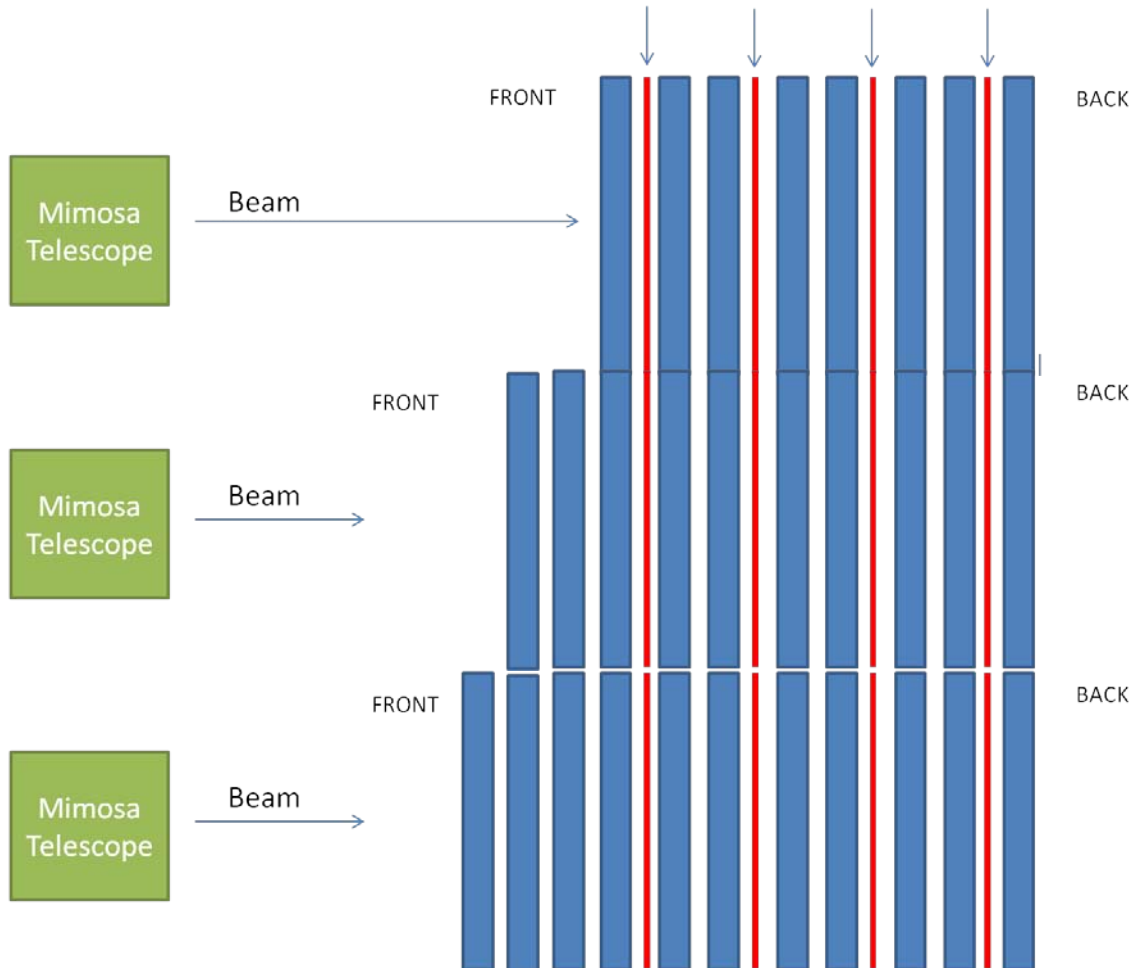
- In the FCAL repository I will add a light version of the EUDAQ we used (also can get from grid).
- There is a converter plug-in for the fcal boards and for the AUX device (FcalAUX), as part of the system.
- I add a file writer to convert .rew files to root files using the system.
- You need to have the file FileWriterFCALRoot.cc and main/src before compiling.
- To run you : from the /bin/ use ./Converter.exe -s -t fcal-root <run number>
- Raw data need to be at the /data
- The -s is for synchronization between fcal and AUX according to TLU number (but it is limited).

Root file

- Each entry in the root file is 1 channel (1 pad), so 128 entries are 1 trigger.
- The Root file contains :
 - Plane (0-4).
 - Channel (0-31).
 - X (0-1).
 - Y(0-17).
 - time stamp
 - Tlu number from fcal
 - Tlu number from AUX
 - Is sync?
 - Run number
 - Data array of 32 samples.
 - Frame counter (for sync with MIMOSA)

Configuration

During test beam we used 3 different configuration for the calorimeter :



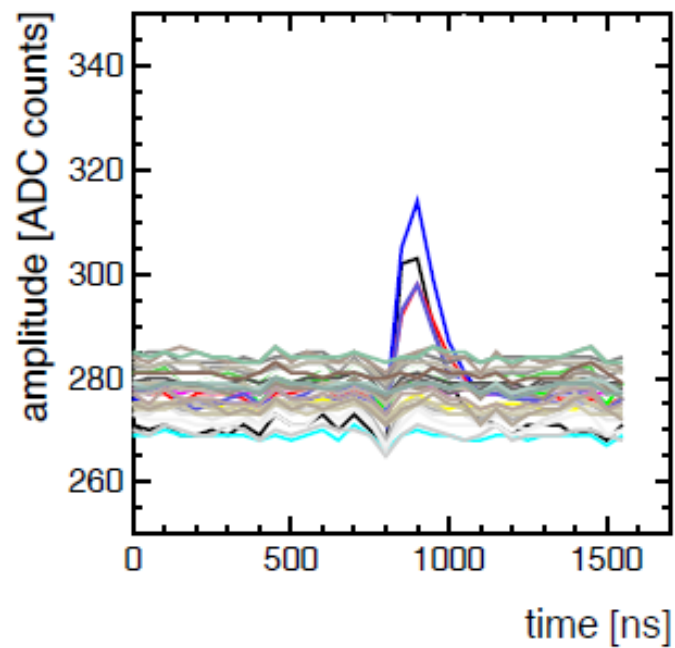
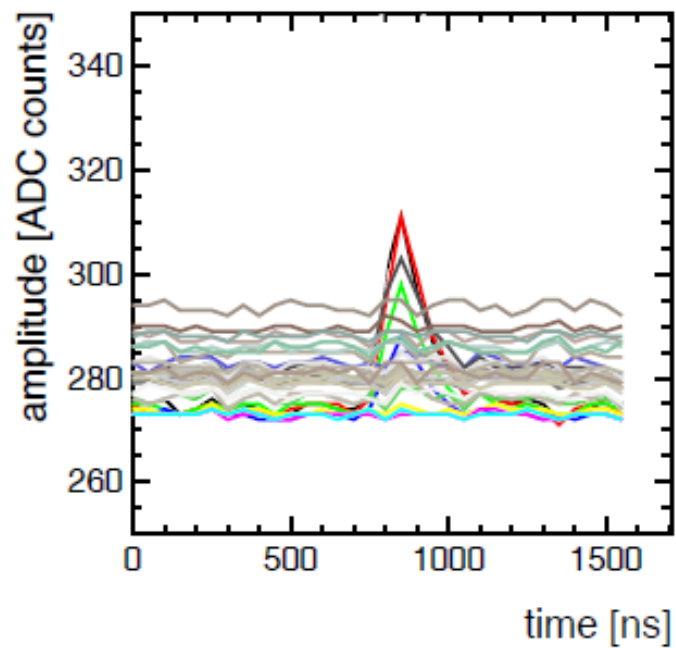
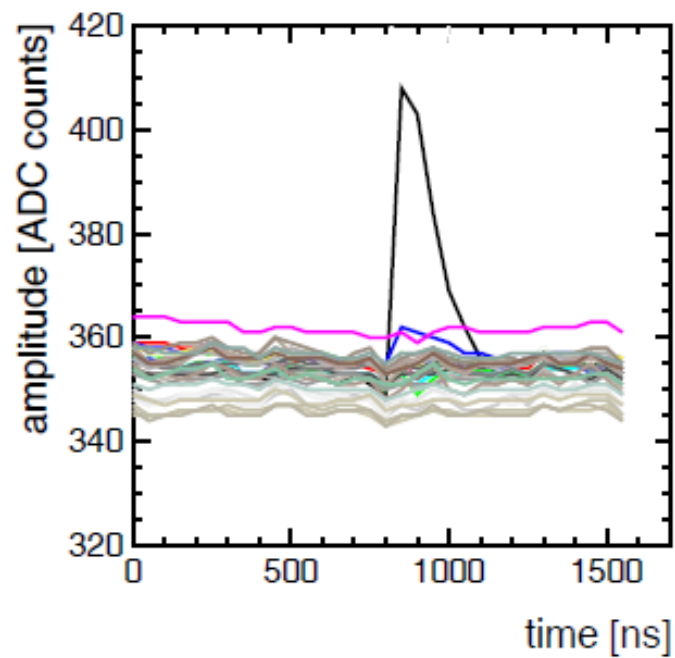
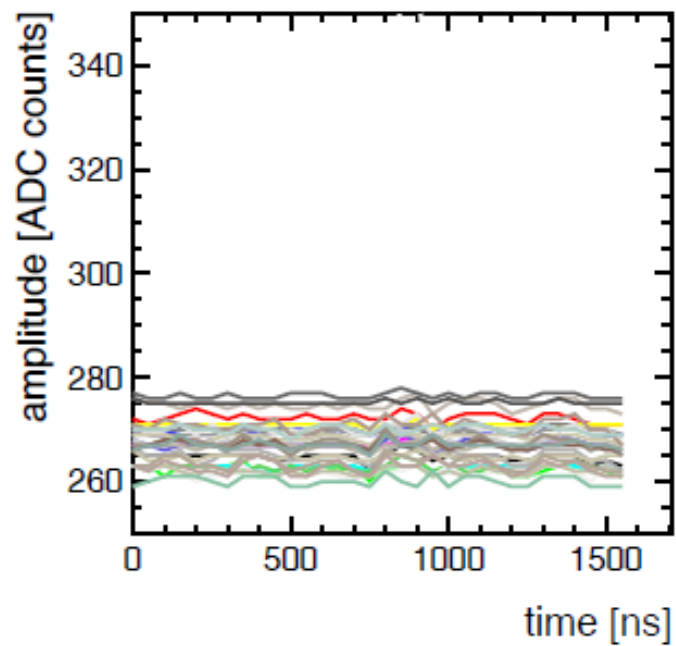
Beam conditions

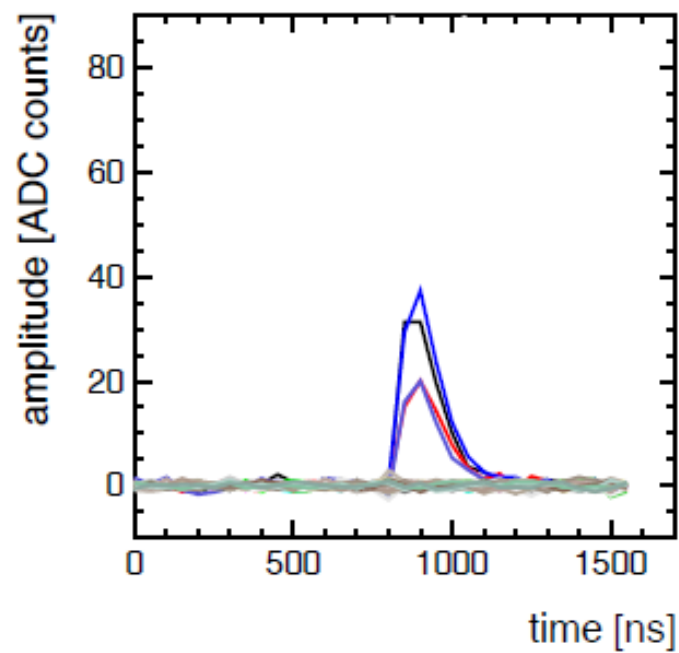
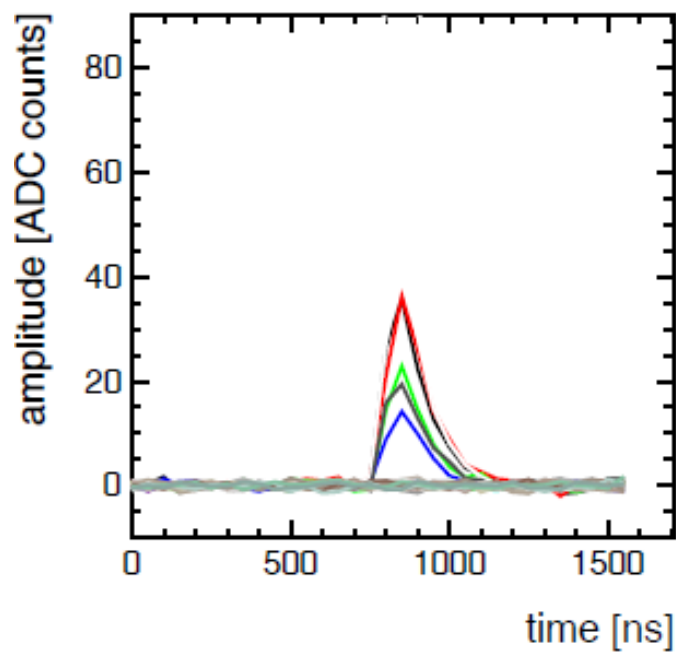
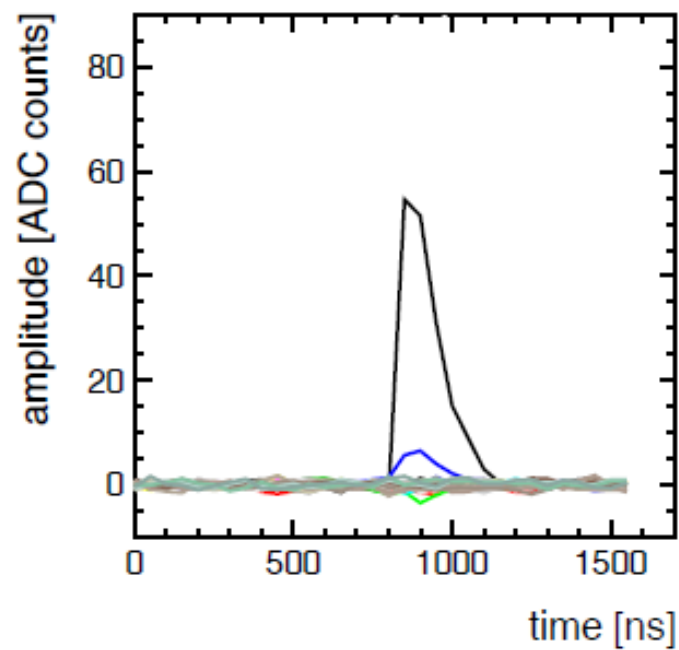
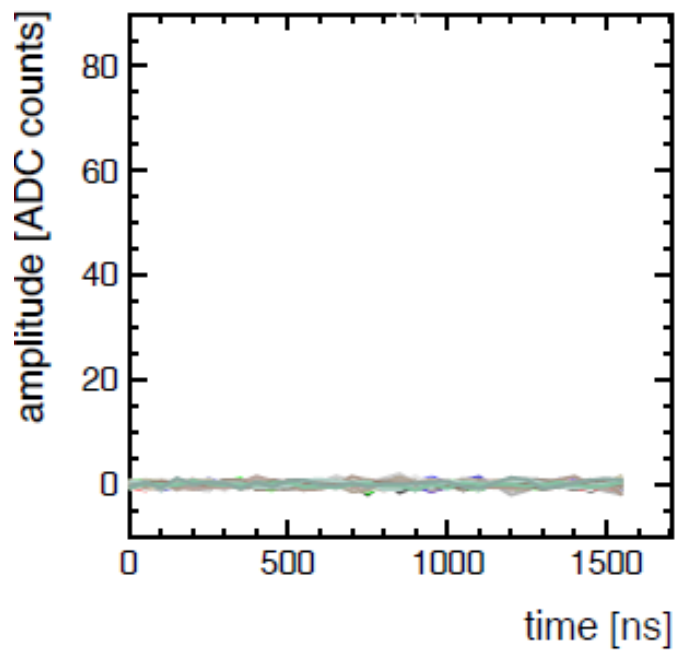
- For all configurations we use 5 GeV negative charged beam.
- For all configurations we take 3 types of runs:
 1. Electron and Muons (with rate restrictions).
 2. Electron and Muons (no rate restrictions).
 3. Hadrons (anticoincidence of e^- & μ^-).

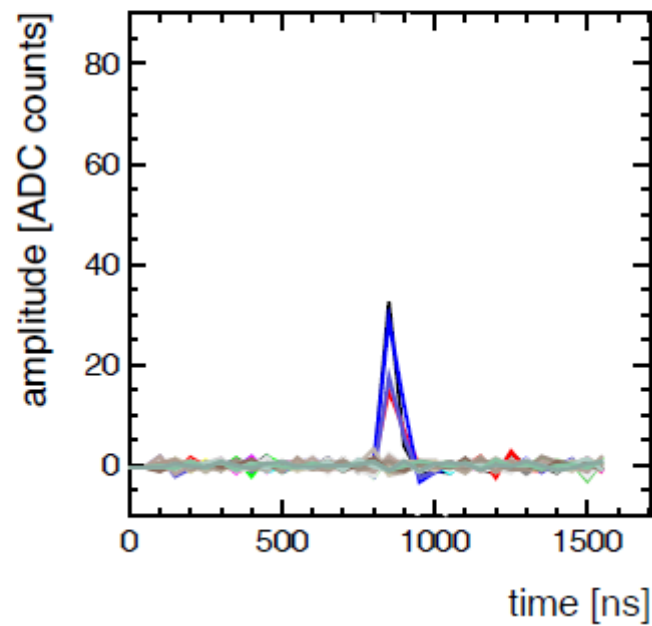
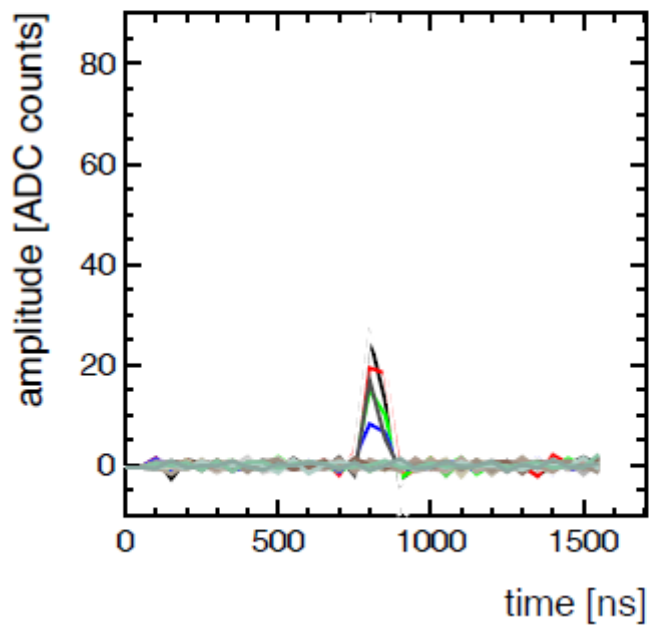
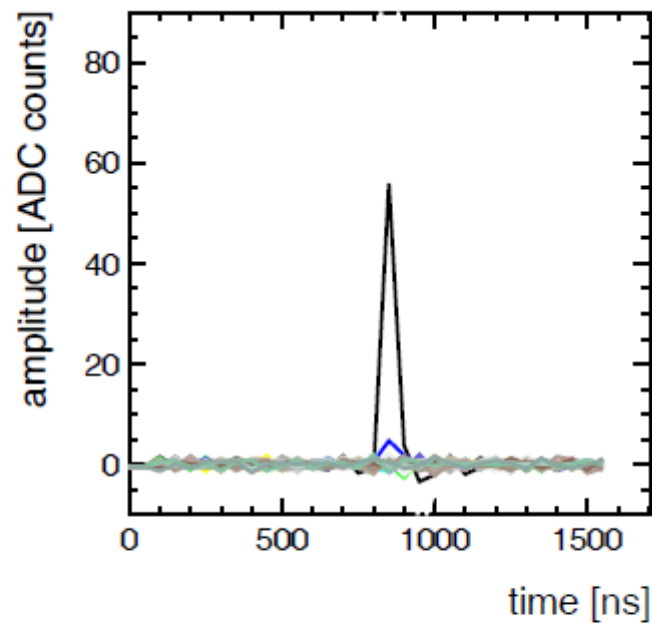
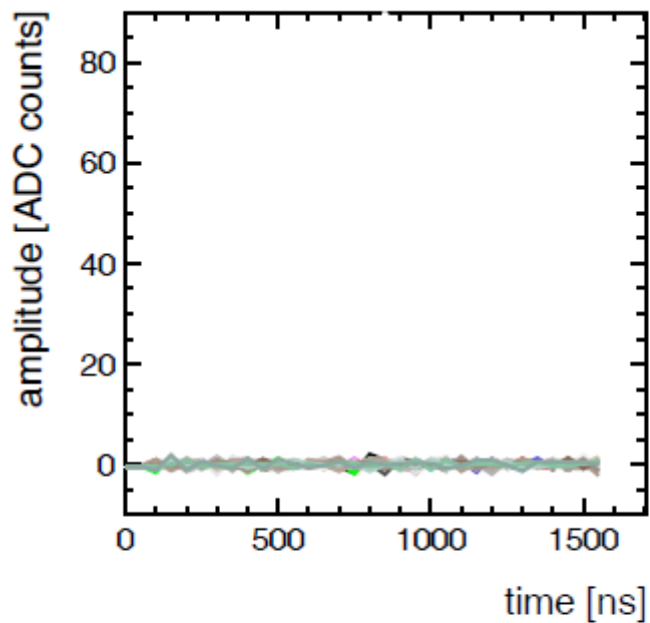
Runs/ events	Beam conditions		Hadron
	e^- & μ^-	e^- & μ^- (no rate...)	
Configuration 1	75 / 30k	3/6k	4/20k
Configuration 2	60/36k	2/8.5	1/2k
Configuration 3	55/45k	7/15k	8/38k

1 event

- Each event need to be process in several steps:
 1. Base line removing and pre-signal RMS calculating .
 2. extract the average CMN from each 8 channels (1 chip) without signals.
 3. Remove CMN.
 4. Using Deconvolution.



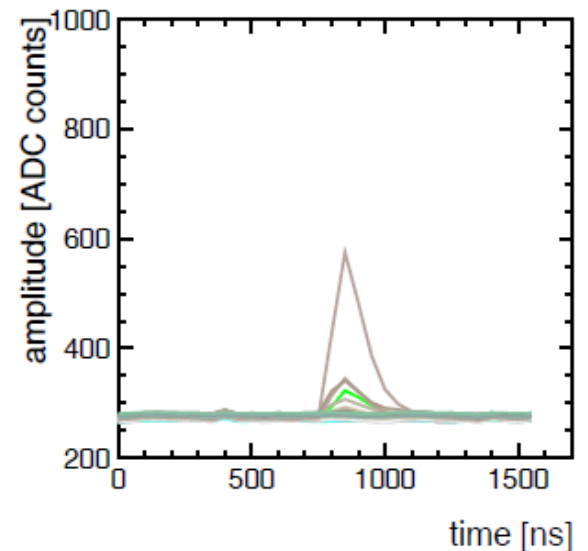
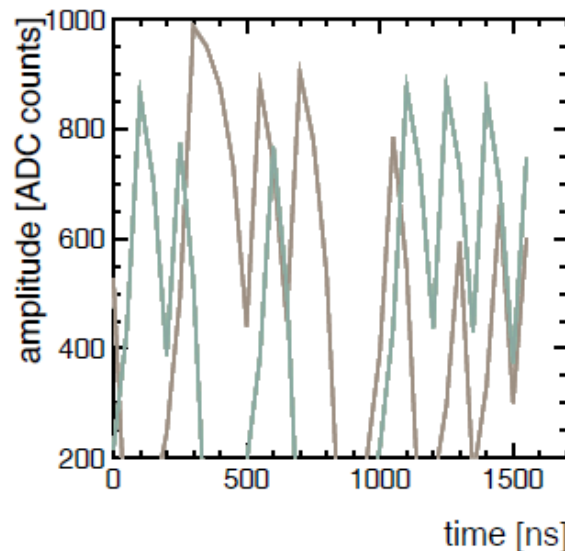
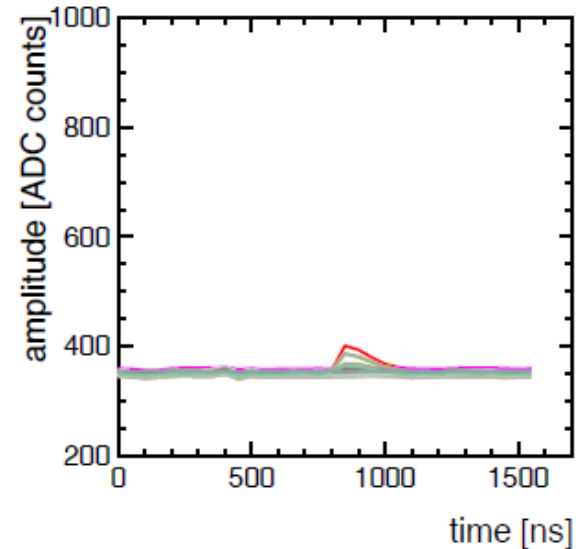
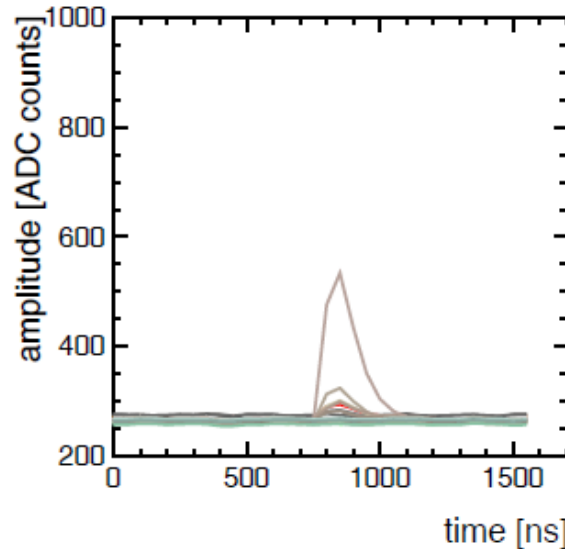




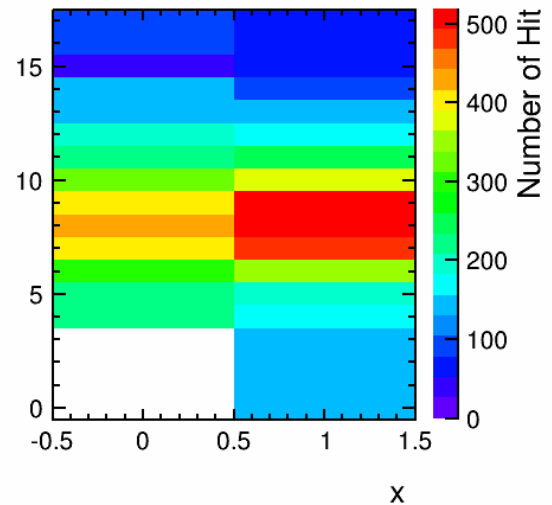
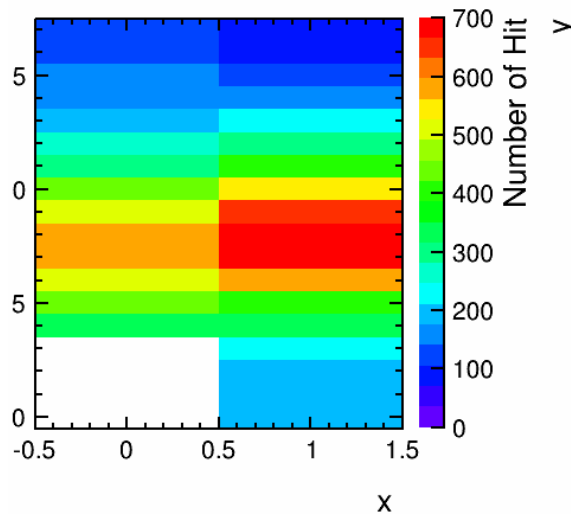
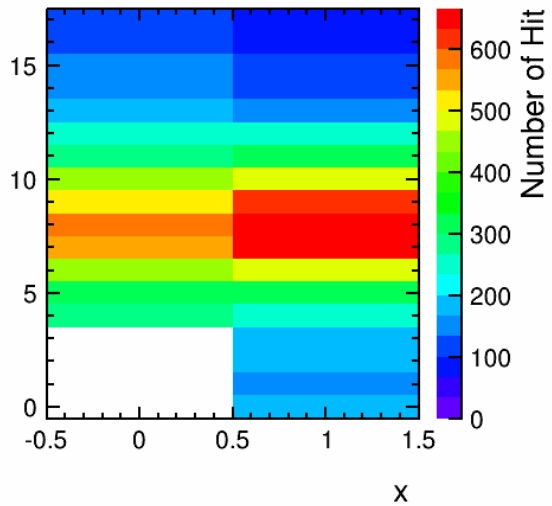
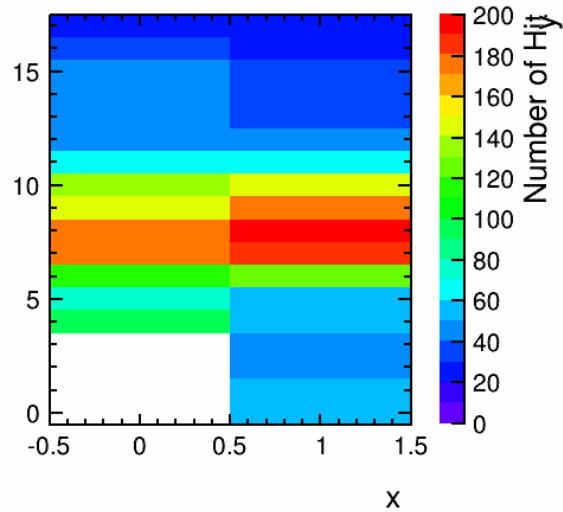
Problems...

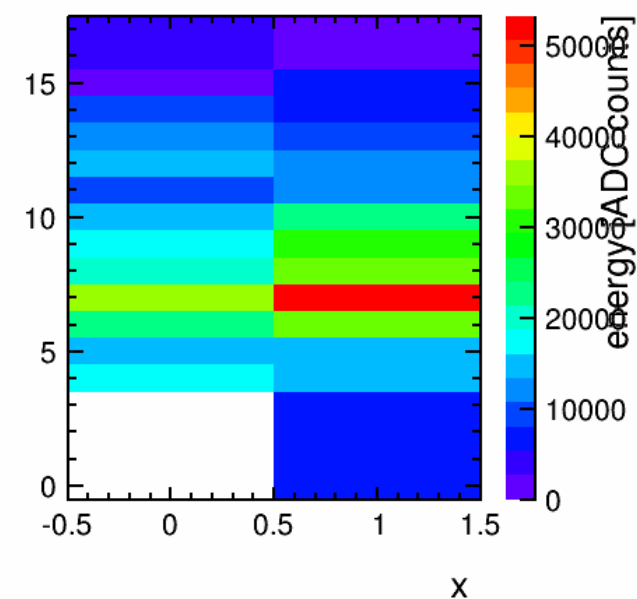
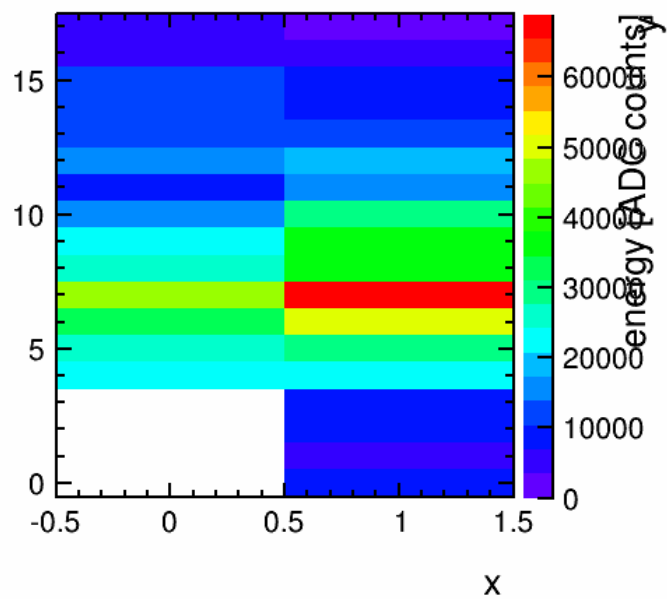
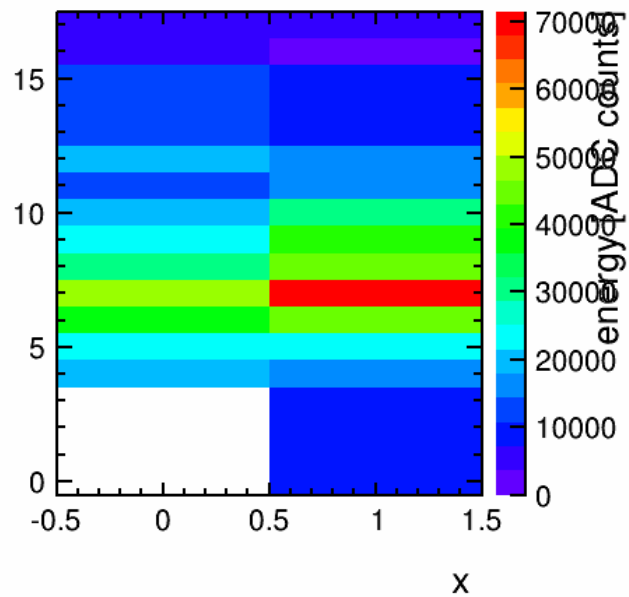
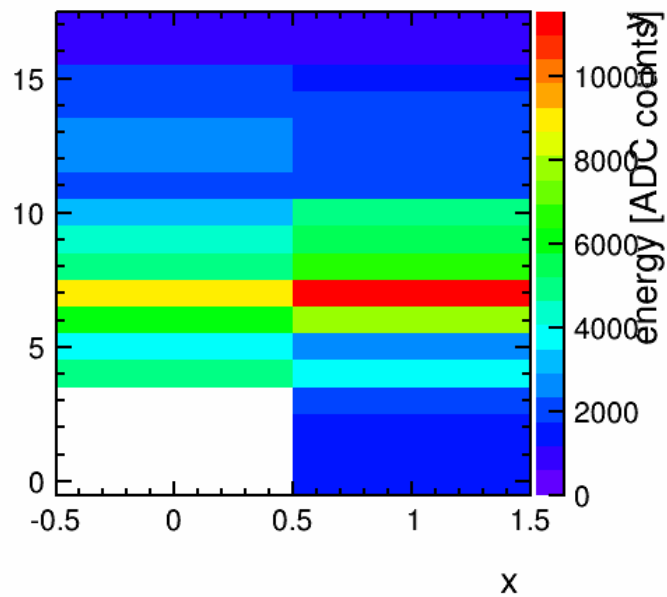
Its look like all file from configuration 3 have plane 2 problems.

This is event 1 from run 381

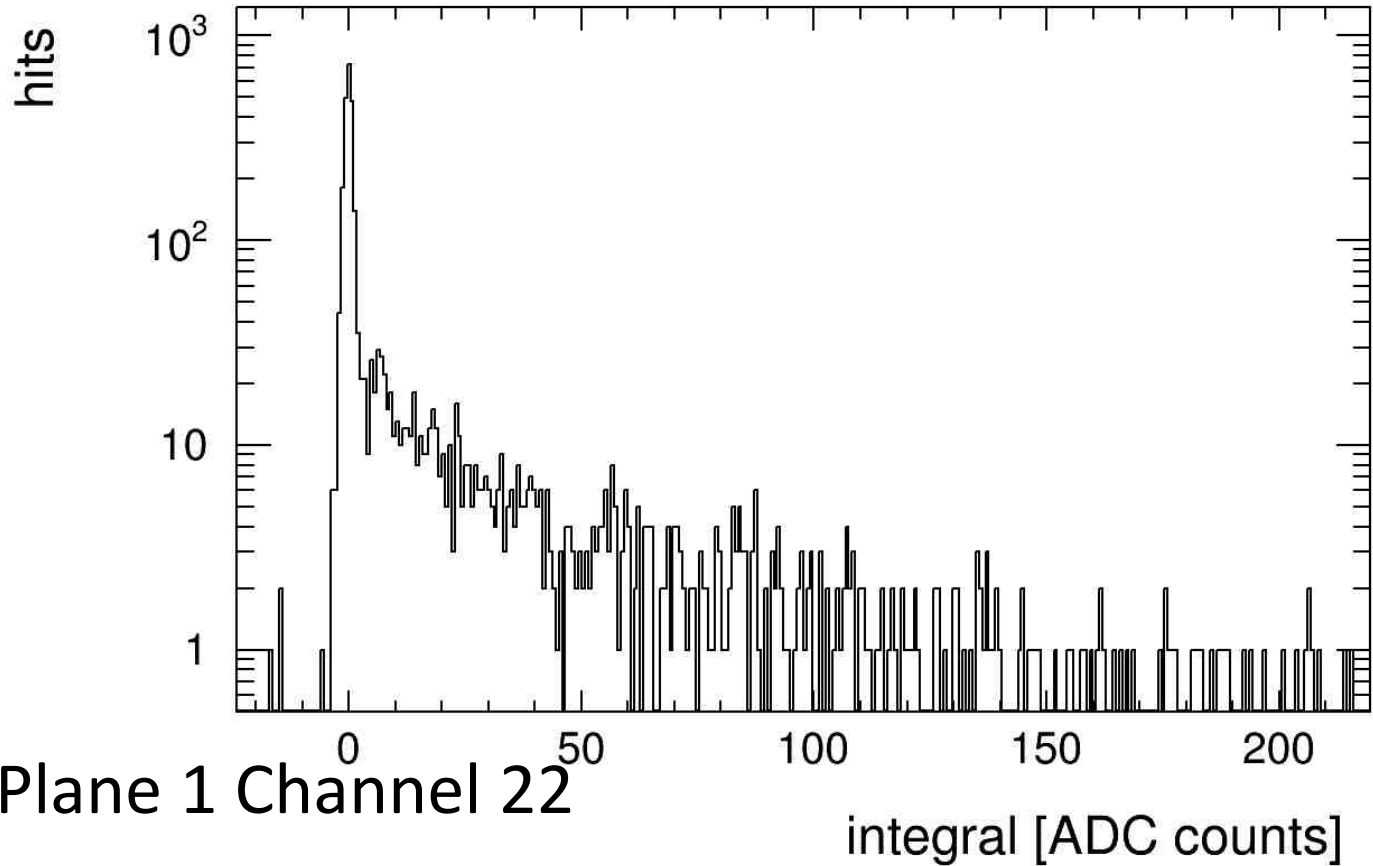


Hit map and energy maps





Pad spectra



Run 237 Plane 1 Channel 22

90 % of event is in the pedestal.

Next steps

- Check noise distribution from fake triggers.
- Try to synchronize with telescope.
- Start to look in to energy distribution and different between electrons and muons.