

Huge background simulations for trigger

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Huge background simulations

- PDM

Standalone code written in C++ by Francesco Fenu

Source of background

Poisson distrib. of avg BG 500 ph/(m² s sr)

PTT algorithm 2nd Level 1 Hz/PDM

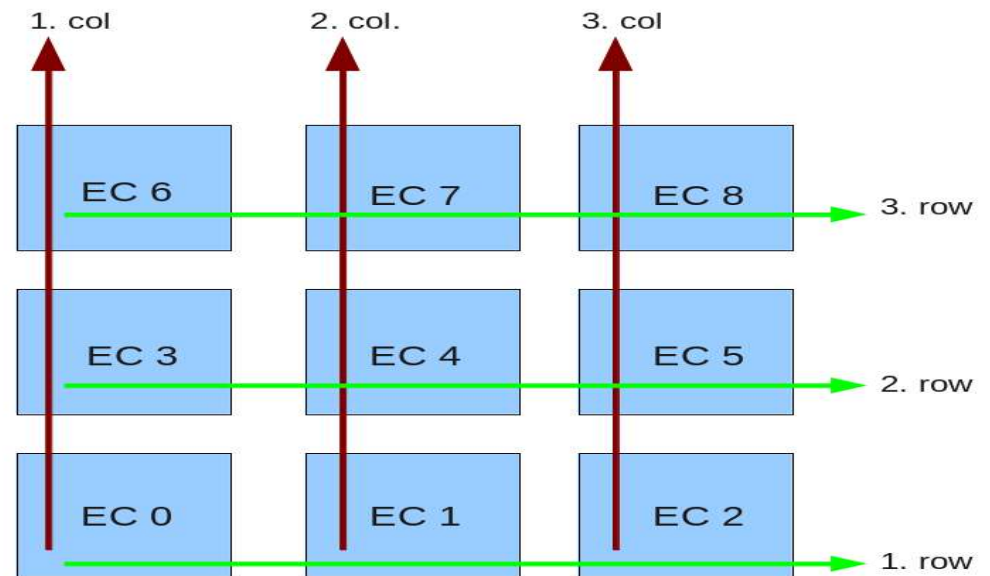
LTT algorithm 3rd Level 1mHz/PDM

40000 GTU/s

10¹¹ GTU/trigger

Code is fast, but since ton produce huge statistics we have to run parallel

Prepared and running on Kosice PC cluster



1 PDM = 9 EC = 1296 pixel

1 EC = 4 x PMT = 144 pixel

1 PMT = M 36 = 36 pixel (6 x 6)

Contribution/Activity: Computing facility – JEM-EUSO cluster

- HW configuration finished
- OS/SW configuration finished on most nodes
- cluster ready for users
- Anyone from JEM-EUSO collaboration can use it
 - to have account, simply write me email to bobik@saske.sk
- **the infrastructure and computational facilities in Slovakia are supported by the project ITMS No. 26220120009, based on the supporting operational Research and development progra financed from the European Regional Development Fund.**



Contribution/Activity: Computing facility – JEM-EUSO cluster

16 node Supermicro® SuperServer AS-1042G-MTF

Configuration of node :

- 4x Opteron 6134 (2,3GHz)
- 16GB RAM
- 600GB SATAII HDD (WD VelociRaptor)

2x master/disk server Supermicro® SuperServer AS-1042G-MTF

Configuration of server:

- 1x Opteron 6134 (2,3GHz)
- 16GB RAM
- 4x 2TB SATAII HDD (WD RE4)

All together:

CPU: 64 + 2 @ 2.3GHz

Cores: 512 + 16

RAM: 264 GB (4GB / CPU)

Disk space: 16x600GB + 8x2TB = 25,2TB



Huge background simulations

The output of PTT triggers stored to ascii file in the format of 5 columns

- row in EC
- column in EC
- persistency (5 levels in Gtu's)
- EC ID
- cts

Size of the PTT output : 250 MB/ 1.e9 Gtu's

We reprocessed it to store like root ntuples: 10 MB/1.e9 GTU's

Two sw approaches to analyze results:

- IDL
- root

The statistics

1.e11 GTU's up to now

5 x e6 PTT triggers

50 GB ascii / 2 GB root

6 LTT triggers

Calculated in 3 weeks on part of cluster

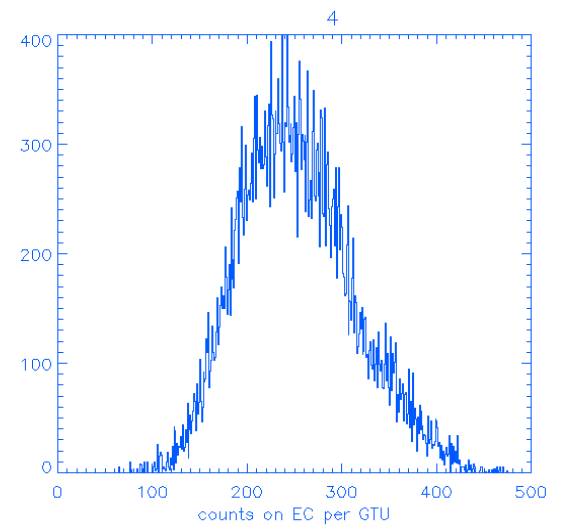
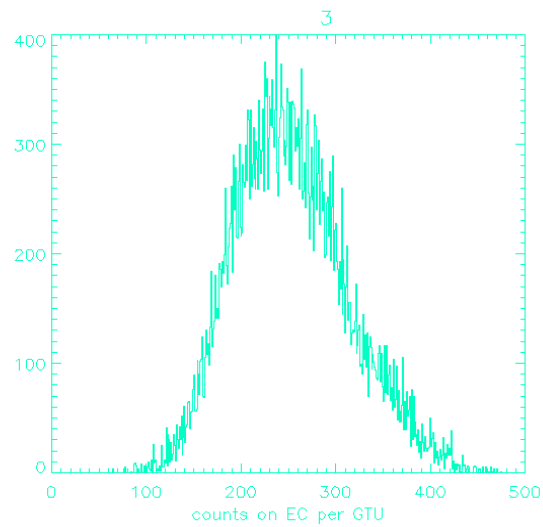
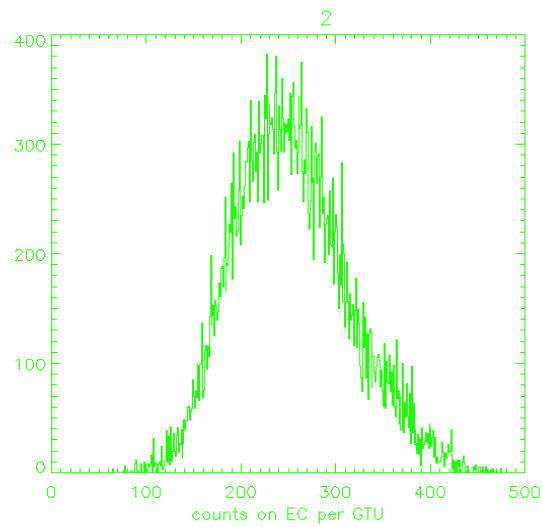
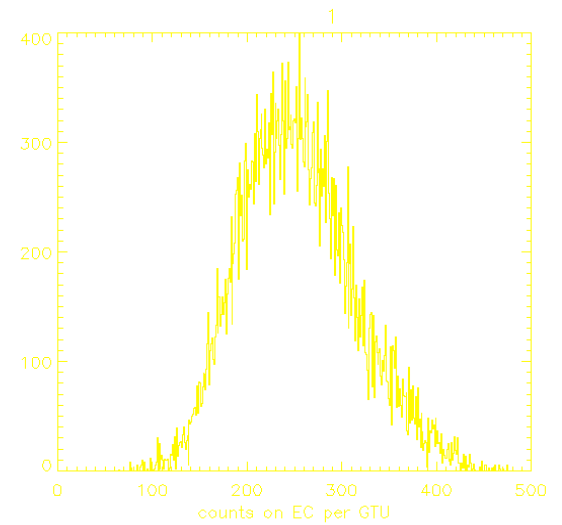
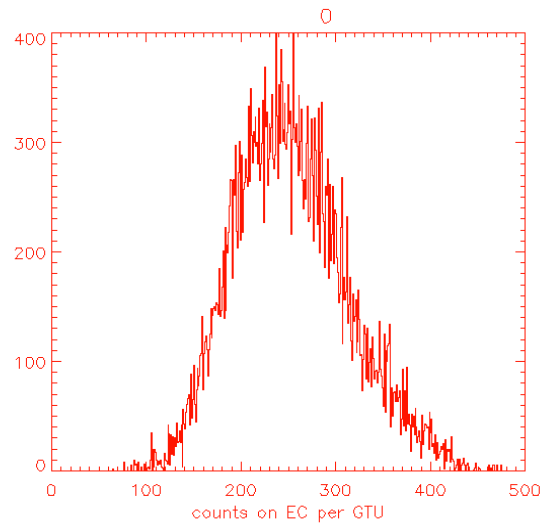
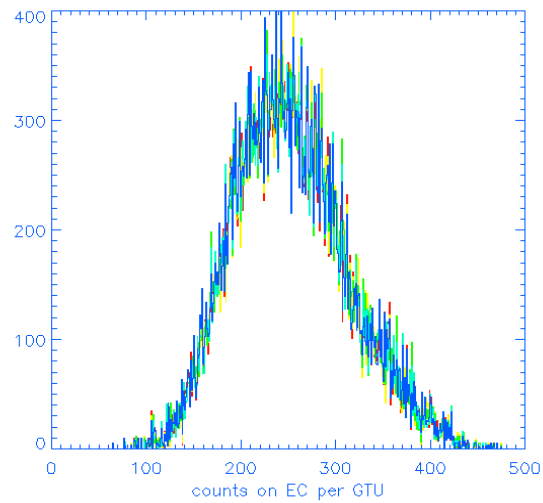
Statistics 1.e12 could be reached in 40 days on full cluster

Attempts to modify/increase primary bkg rate failed due to rapidly increase of CPU and memory resources

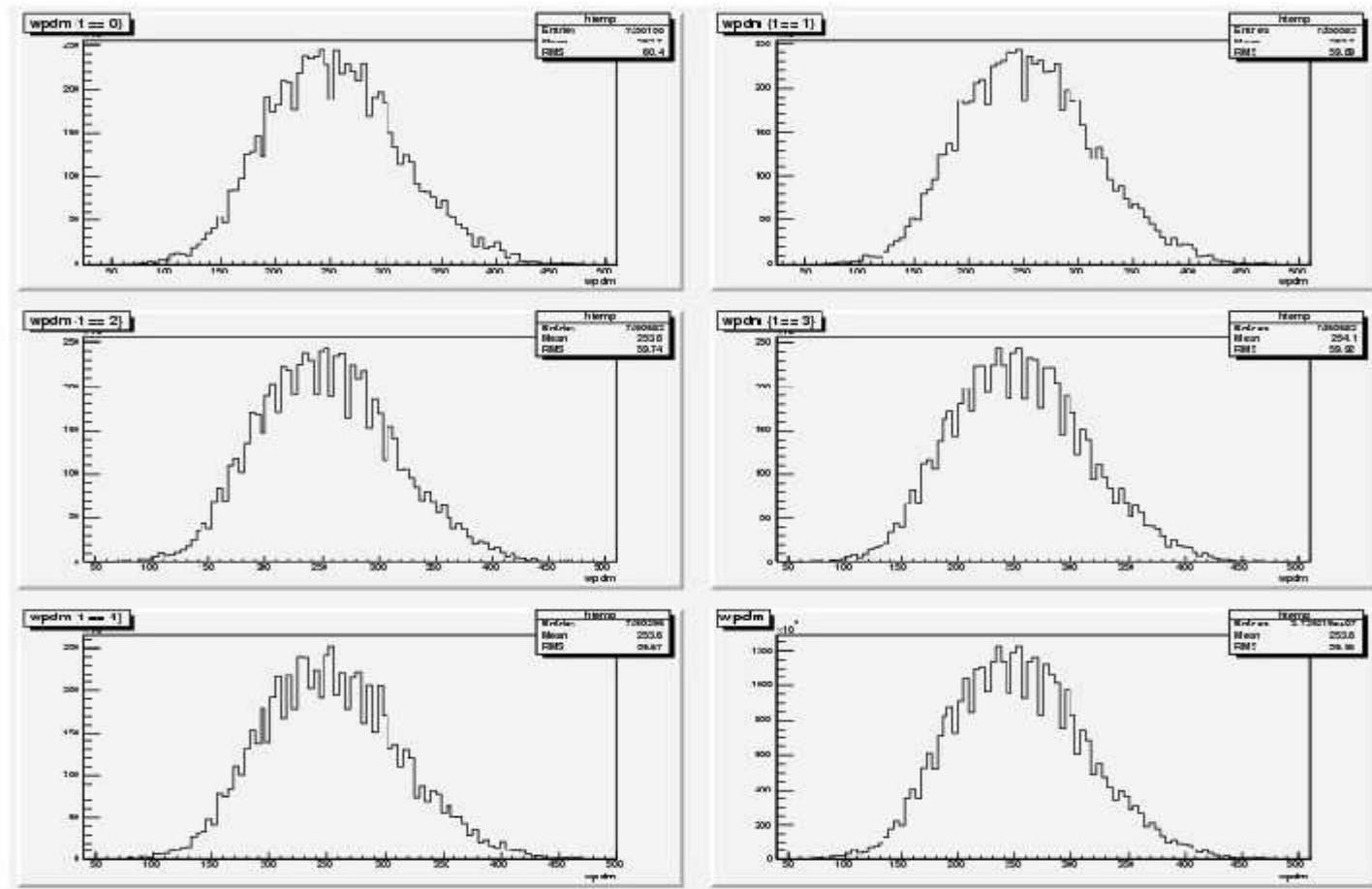
The code is very "sensitive" to threshold parameters.

Has to be discussed with Mario, modified and prepared for massive simulations

Some vizualization of obtained results cts/PDM (by IDL)



Some visualization of obtained results the same by root



Some vizualization of obtained results

