

# PHOS status report

Boris Polishchuk

ALICE Offline Week,  
7-11 March 2011

# Offline Software

Reconstruction code is stable since Summer 2010

- last major bug fix — 4.06.2010
- few minor fixes
- two major commits:
  - L1 phase treatment (PHOS timing)
  - improved non-linear energy correction
- the rest is Coverity bug fixes

# Coverity

- No more Coverity defects found in Reco code by today!
  - No Memory Leak defects found in Reco code
  - 99% of defects are:
    - «Secure Coding»
      - printf..
    - «Forward Null»
      - if(!phosGeom) AliFatal()..
- 16 defects are still there..
  - «Secure Coding», «Forward Null»

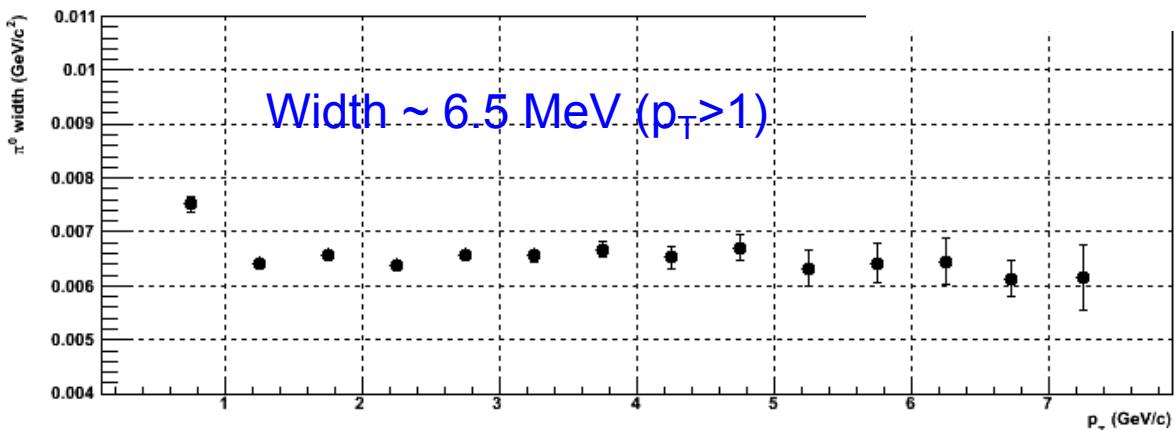
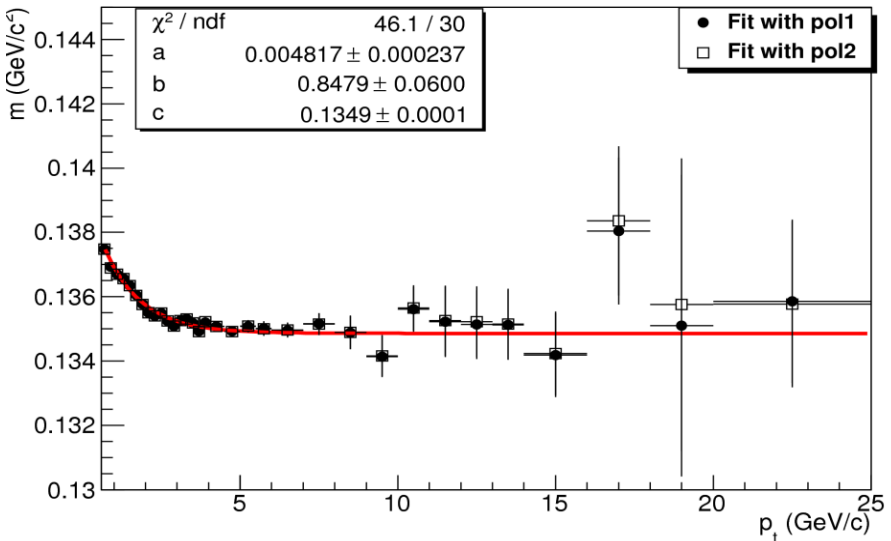
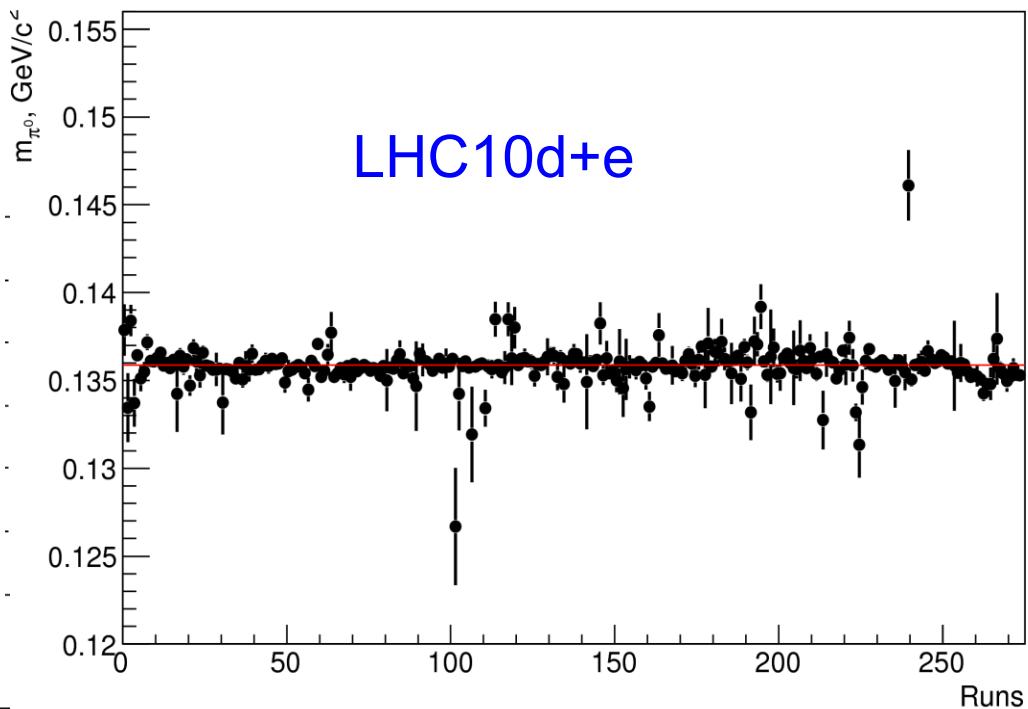
# Online DA status

- One working DA: [PHOSLEDda.cxx](#)
  - running in LED runs
  - fills HG/LG histograms (one per channel) and writes them to a Reference Storage
  - **no online OCDB updates!**

# Calibration: channel by channel mean energy equalization

- fixed in July 2010, 80M pp min.bias
- will be used in pp runs at 2011

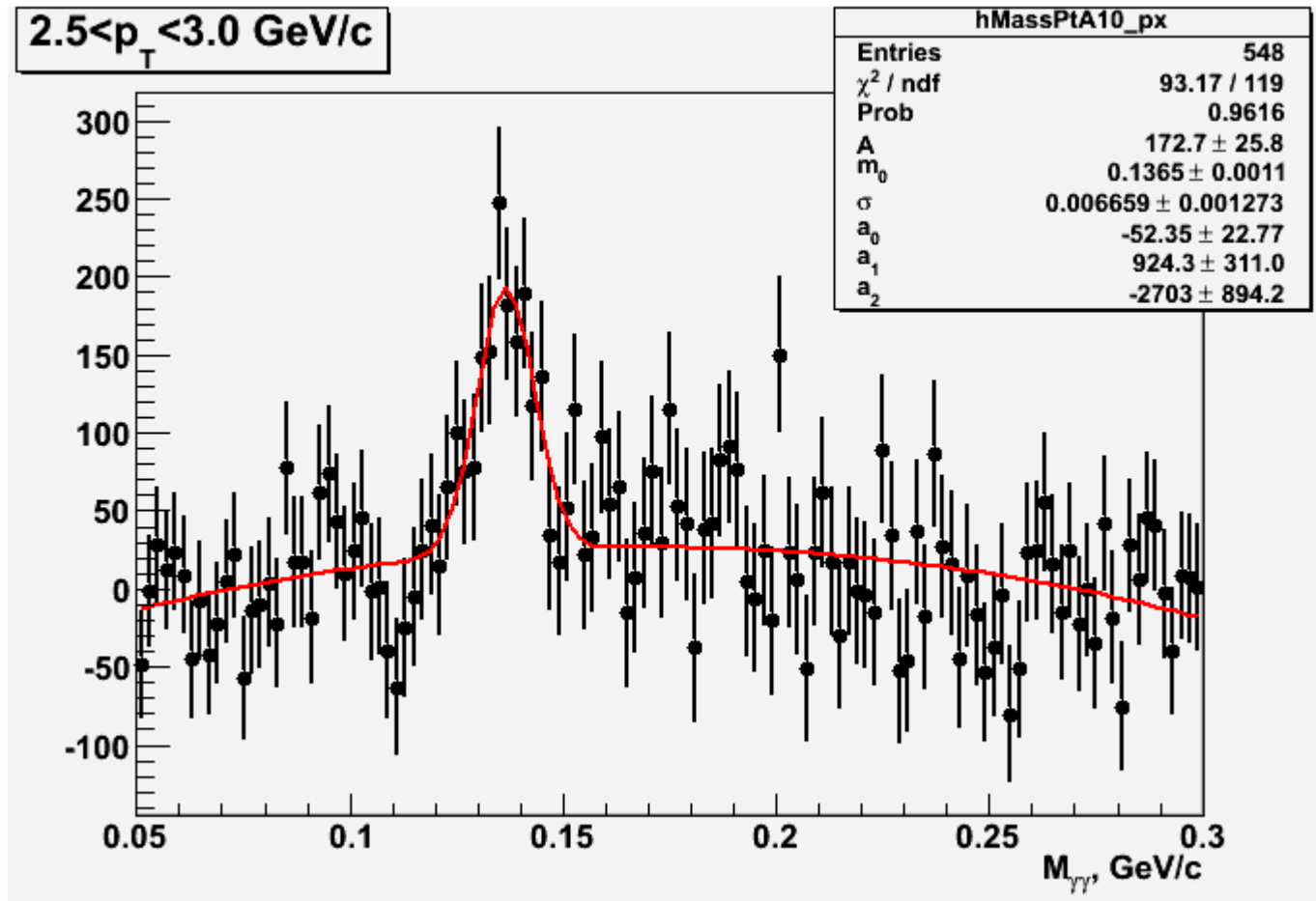
$\pi^0$  mass vs Run number



In LHC10h (PbPb) PHOS temperature was +3°C higher, so we used different calibration

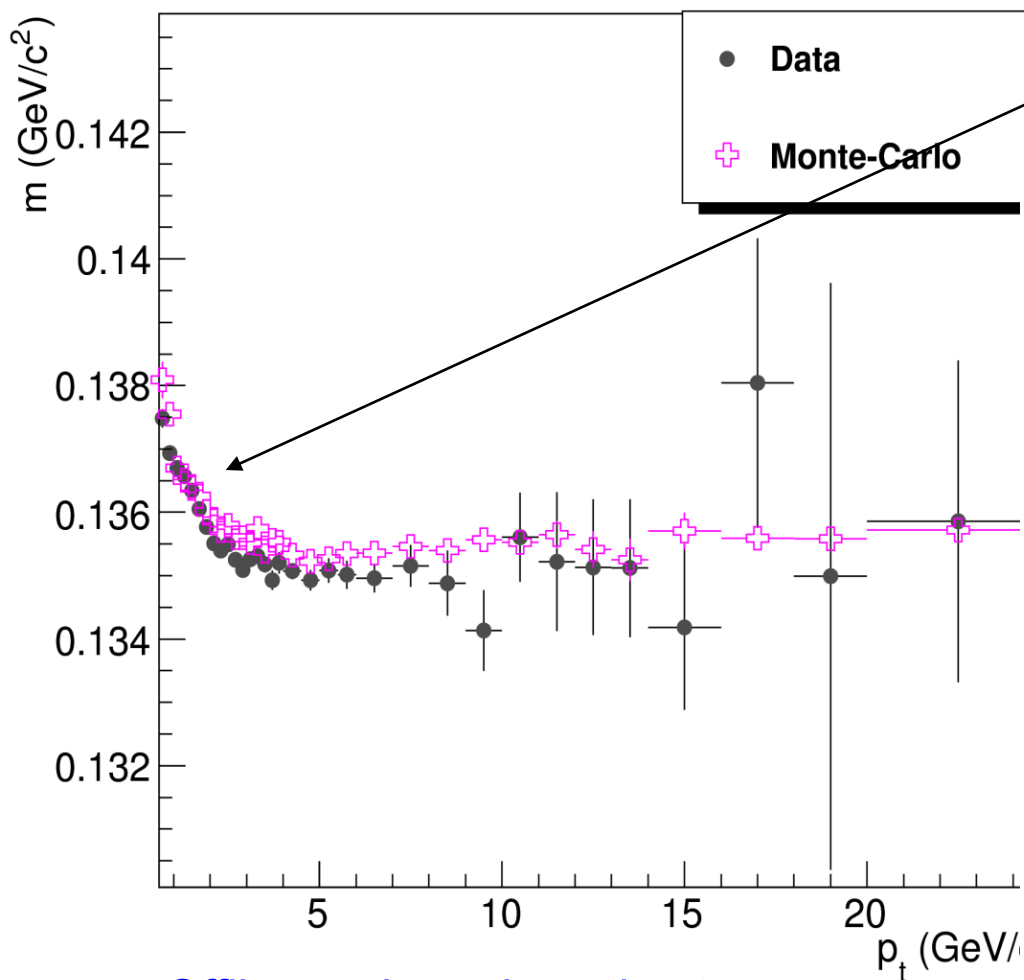
- all (reconstructed) statistics used
- $\pi^0$  mass: 123 MeV  $\rightarrow$  135 MeV

# LHC10h Pass2: new calibration

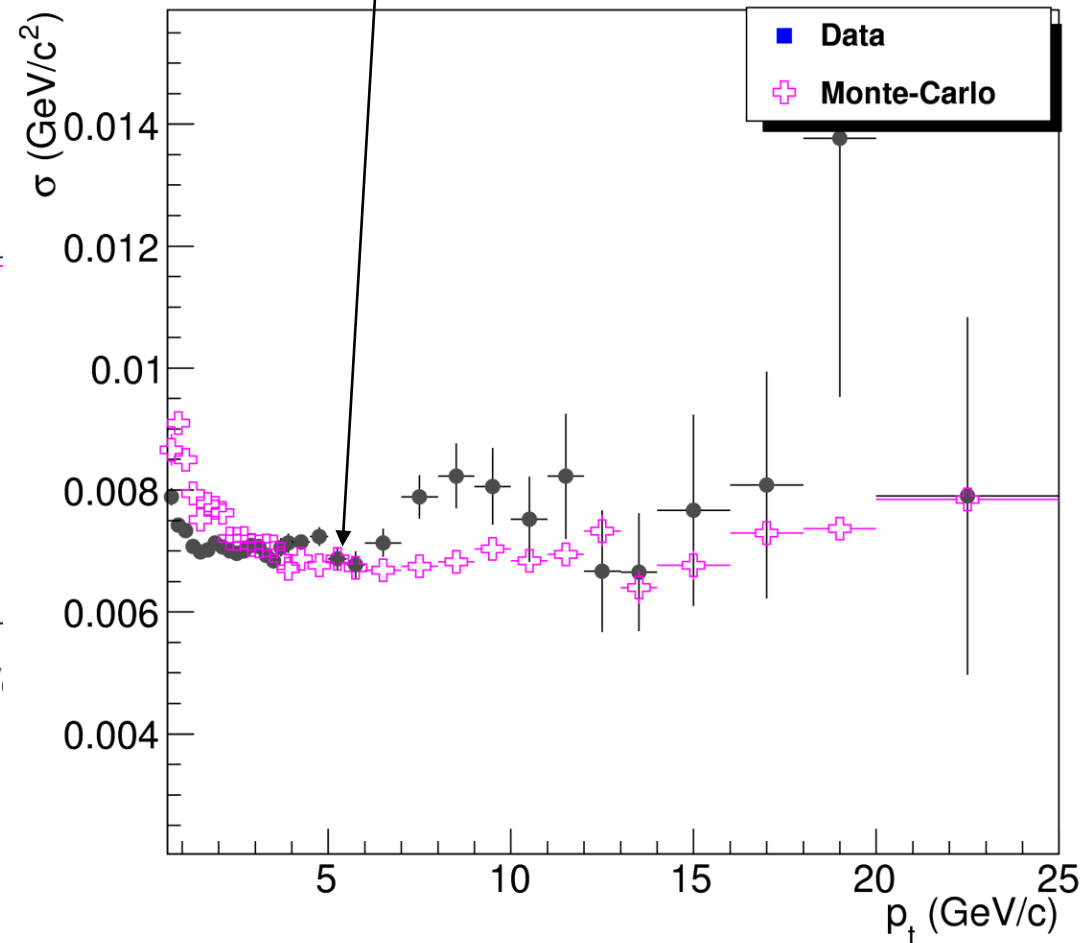


Run 138200, PbPb min. bias

# Simulations



Non-linear correction to cluster energy  
+  
7% Gaussian deconvolution



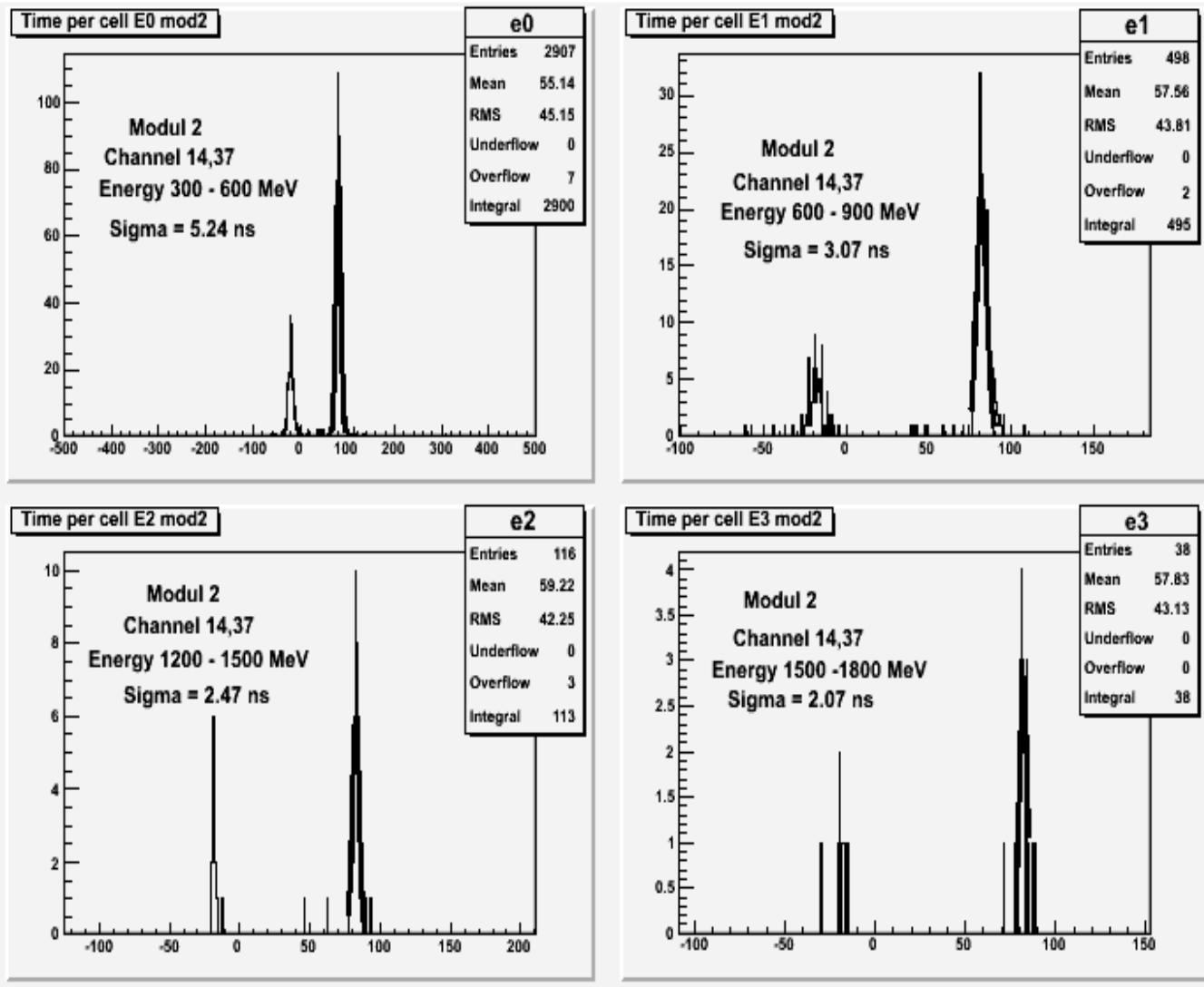
- Offline code underestimates real deconvolution and non-linear effects at low  $p_T < 2$  GeV
- Corrections applied «on-the-fly» in the analysis code
- Crucial for the efficiency studies

# Time resolution

Time calibration has been made on the subset of LHC10h data

$$\sigma = 2\text{ns}$$

at 1.5 GeV



TODO:

- understand the origin of small second peak
- increase statistics to higher energies
- pT-dependence?

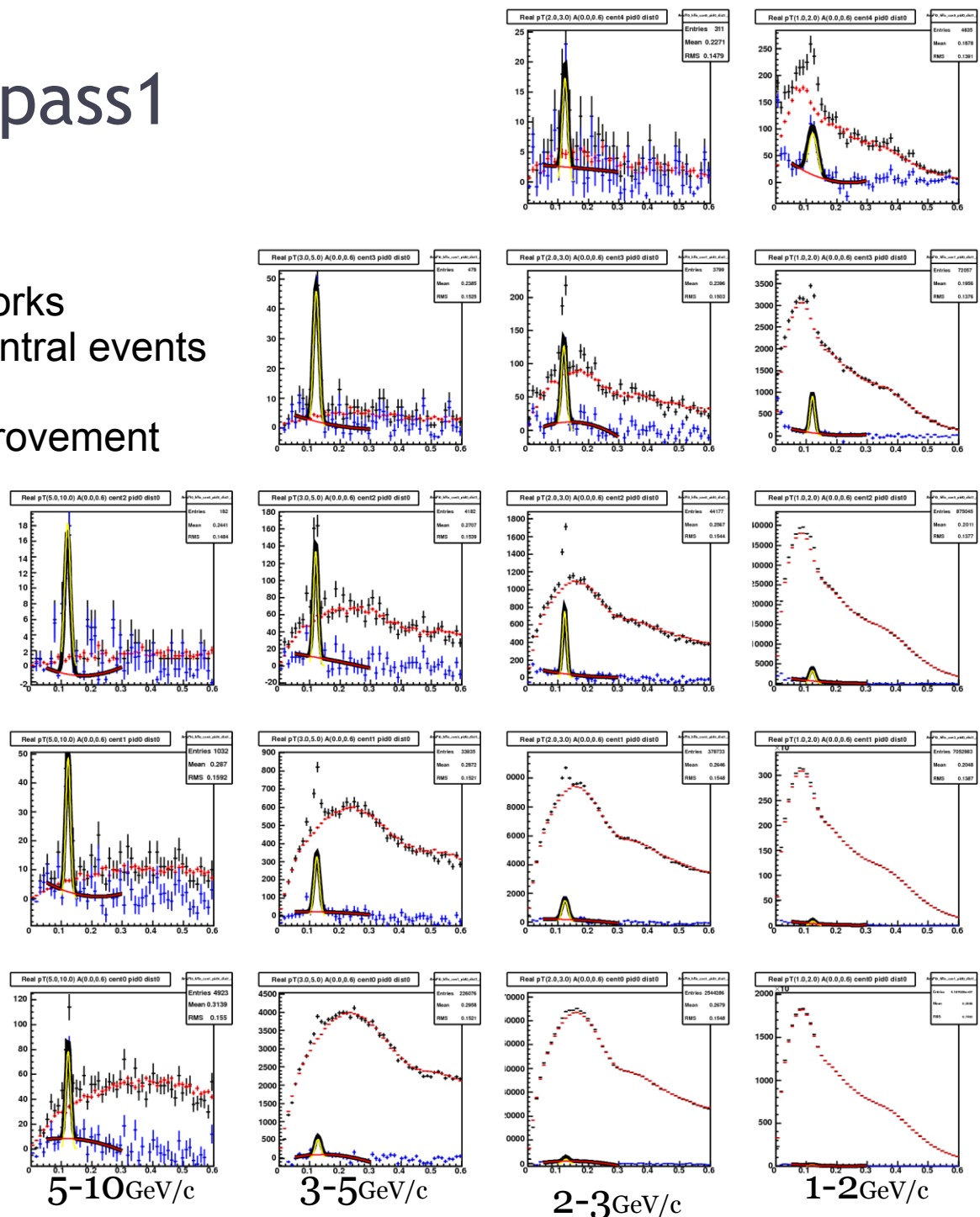
Time in the cell (x=14,z=37)



# $\pi^0$ in LHC10h pass1

- Background subtraction works already at 2 GeV in most central events
- Still plenty of room for improvement with better PID.

20M events



80-100%

60-80%

40-60%

20-40%

0-20%

5-10 GeV/c

3-5 GeV/c

2-3 GeV/c

1-2 GeV/c

# Calibration Strategy

PHOS would benefit by «10% strategy», if:

- «10%» would embrace the statistics well enough to surpass the precision of the existing calibration;
- number of iterations is ~5-7;
- final OCDB update would be made «by hands» half-automatically

# Summary

- PHOS software is in a good shape to proceed with HI papers. First results are encouraging.
  - all vital components (embedding, event mixing, PID..) are tested
- Calibration for 2011 is good, but not final