

# LAr Response to pions: Data vs MC



S.Paganis (Wisconsin)

with

Isabelle Winterger, Martin Aleksa

LAr+Tile H8 pion CTB Meeting,  
CERN, 17-May-2005

# Analysis (10.0.2 data+MC)

---

- ◆ Run: 2100482 20GeV pions
  - Fully combined, have shown previously problems in LAr rec. energy
- ◆ Parabola Energy reconstruction
  - 15ADC "cubicADCcut" in LArRawChannelSimpleBuilder.cxx
  - $\mu$ A2MEV numbers from EMTB
- ◆ EMTB 3x3 clustering
- ◆ No cluster corrections, No Longitudinal weights
- ◆ No shower cuts yet.
- ◆ MC
  - New "pythonized" version
  - Charge collection corrections
  - Tried to get "correct" beam profile ...
  - ADC2MEV+Pedestal File in Digitization step

# Setup of LArROD\_jobOptions.py for Parabola

```
#####  
#  
# This job option fragment is to create LArRaw Channels  
# from LAr Digits  
#  
#####  
# Properties for ROD:  
#####  
theApp.Dlls += ["LArRawUtils", "LArROD"]  
#sp-start  
theApp.TopAlg += [ "LArRawChannelSimpleBuilder" ]  
LArRawChannelSimpleBuilder = Algorithm( "LArRawChannelSimpleBuilder" )  
LArRawChannelSimpleBuilder.maxSamp      = 2  
#LArRawChannelSimpleBuilder.RecoMode    = "CUBIC"  
LArRawChannelSimpleBuilder.RecoMode     = "PARABOLA"  
#  
#Modified May/2/2005 for tests  
#  
LArRawChannelSimpleBuilder.CubicAdcCut = 15.  
LArRawChannelSimpleBuilder.DataLocation = "LArDigitContainer_MC"  
LArRawChannelSimpleBuilder.LArRawChannelContainerName = "LArRawChannels"  
LArRawChannelSimpleBuilder.UseRampDB = True  
LArRawChannelSimpleBuilder.UsePedestalDB = True  
#sp-end  
#LArRawChannelSimpleBuilder.UseOFCTool=TRUE  
# Turn off printing for LArRoI_Map  
ToolSvc = Service( "ToolSvc" )  
ToolSvc.LArRoI_Map.Print=FALSE;  
# MC symmetry  
ToolSvc.LArAutoCorrTotalTool.MCSym=TRUE  
#ToolSvc.LArOFCTool.MCSym=TRUE  
ToolSvc.LArOFCTool.MCSym=FALSE  
# SP: addition for parabola for 10.0.2:  
ToolSvc.LArParabolaPeakrecoTool.correctBias=True  
#####
```

Consistent ADC2MEV  
Consistent Noise

10.0.2: MC will not work  
without this correction

# MC production on the GRID started

[http://atlas.web.cern.ch/Atlas/GROUPS/SOFTWARE/OO/testbeam/simulationCTB/production\\_1002.html](http://atlas.web.cern.ch/Atlas/GROUPS/SOFTWARE/OO/testbeam/simulationCTB/production_1002.html)

## Production includes:

Digitization with OFCs and Parabola (with proper jobOptions)  
Photon run simulation (non trivial)

Information: Manuel Gallas, Mireia Dosil + ... ?

People already started tests: Damir Lelas + more

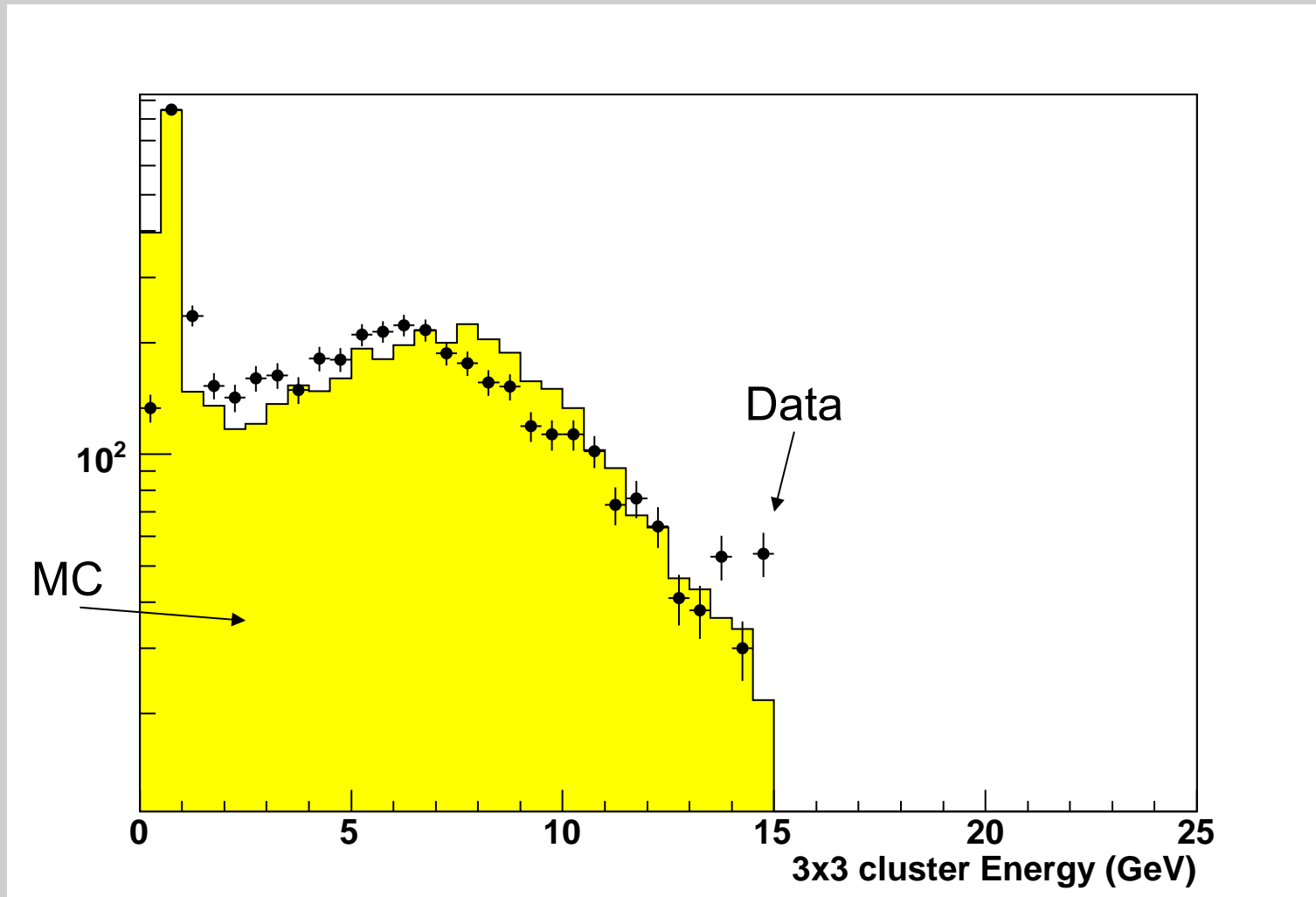
## Production Status:

Total: 4000 sim jobs (electrons and pions)

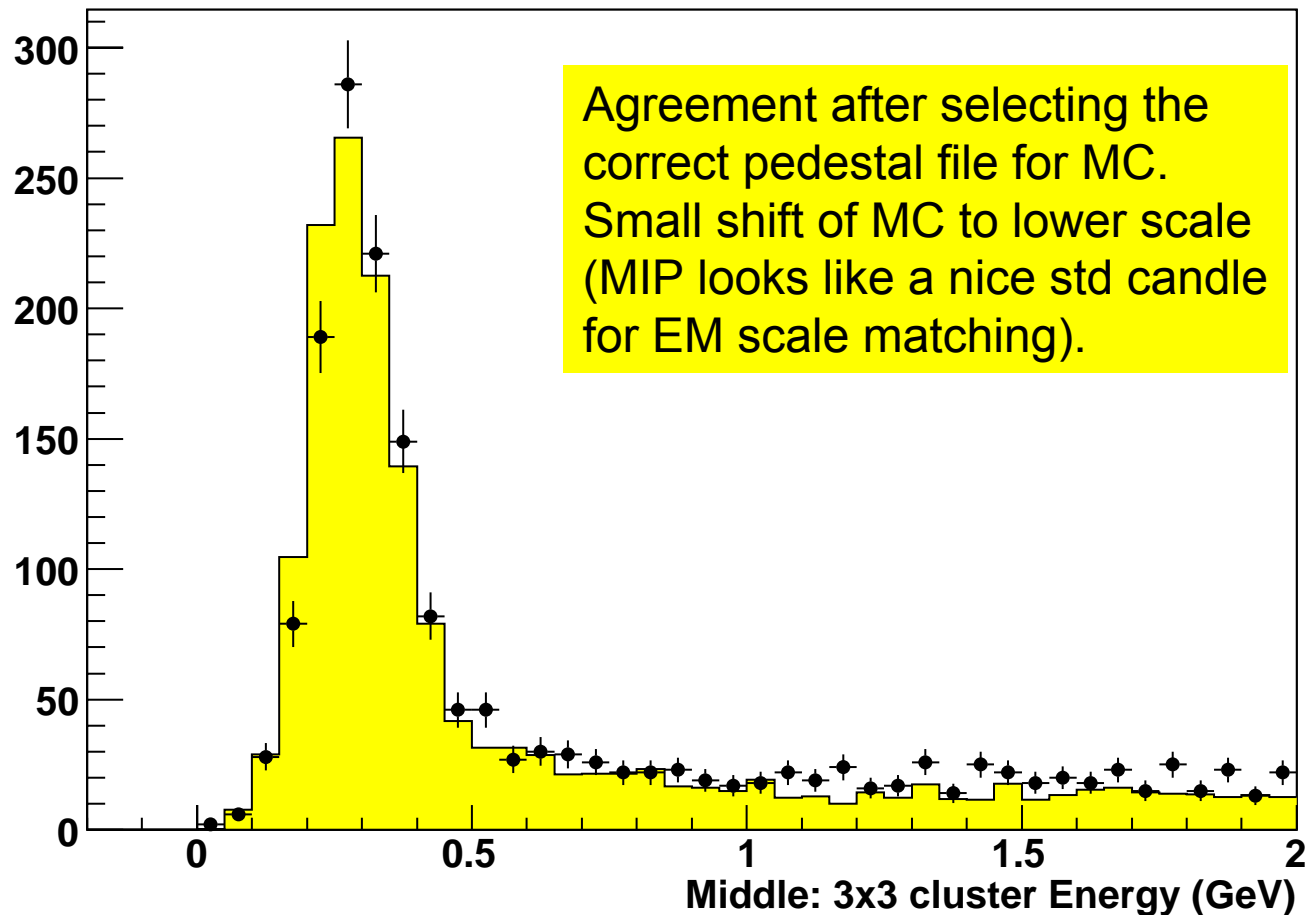
Done: 1430 sim jobs

Digitization will follow: very fast, users can do this even interactively @Ixplus

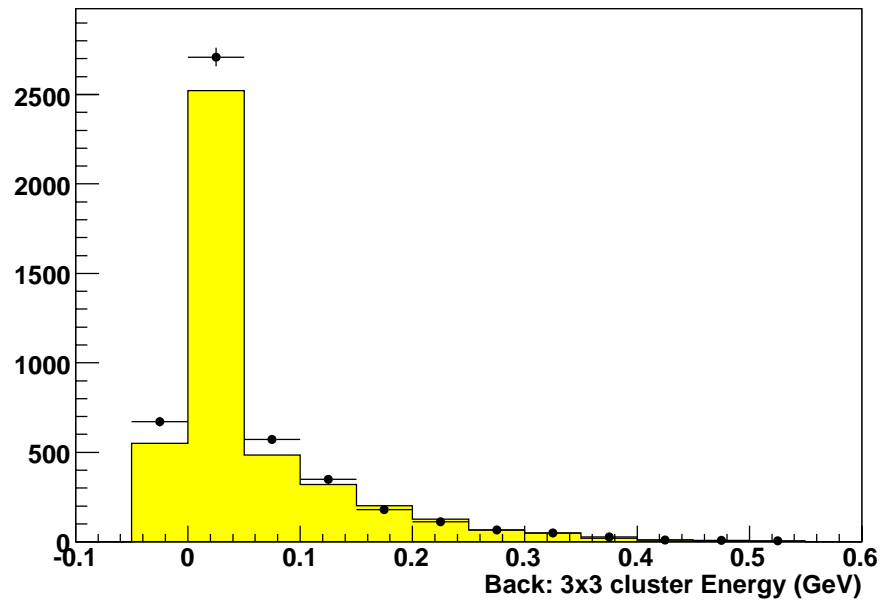
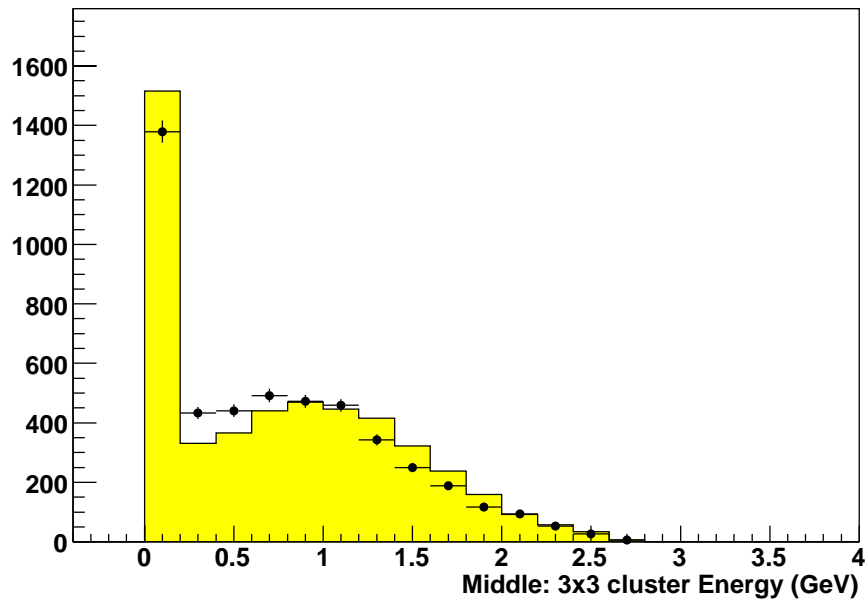
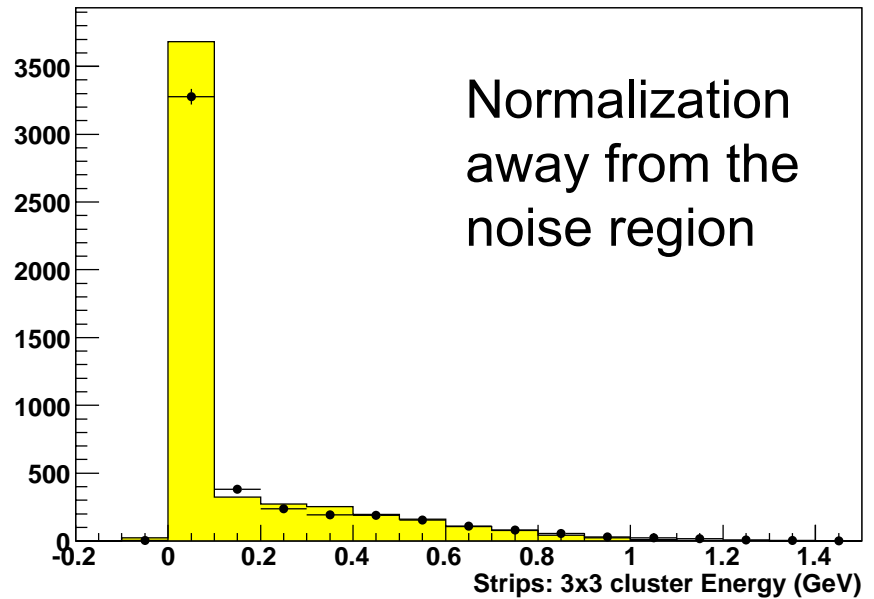
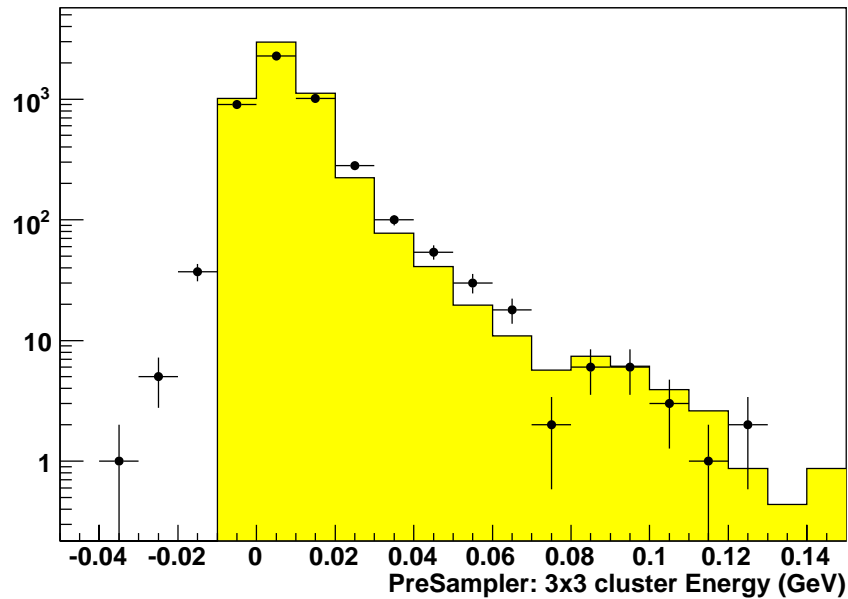
# LAr Energy after simple cuts



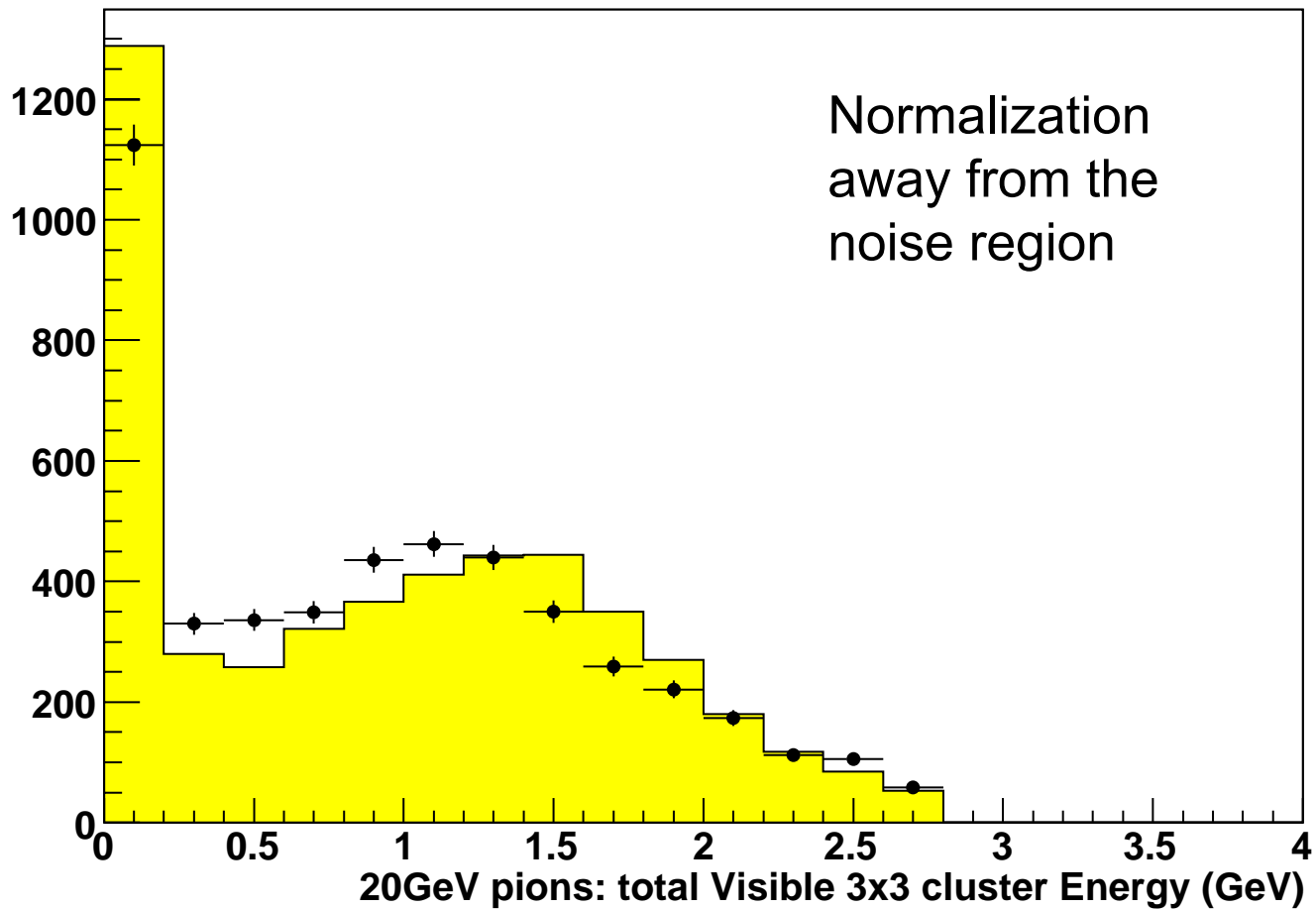
# Zoom in the "MIP" region (after cuts)



# Visible Energy per LAr Sampling



# Total visible Energy (LAr)



# Summary

---

- ◆ Comparison between Data and MC:
  - Agreement in the noise/MIP region
  - MC shows a somewhat deeper shower: more people are now checking.
  
- ◆ Large MC production has started with both OFCs and Parabola (for initial tests).
  - It took some time to learn how to run MC parabola since it was not the default LAr running mode.