Barrel EMC and SMD Status Tables

Oleksandr Grebenyuk, NIKHEF

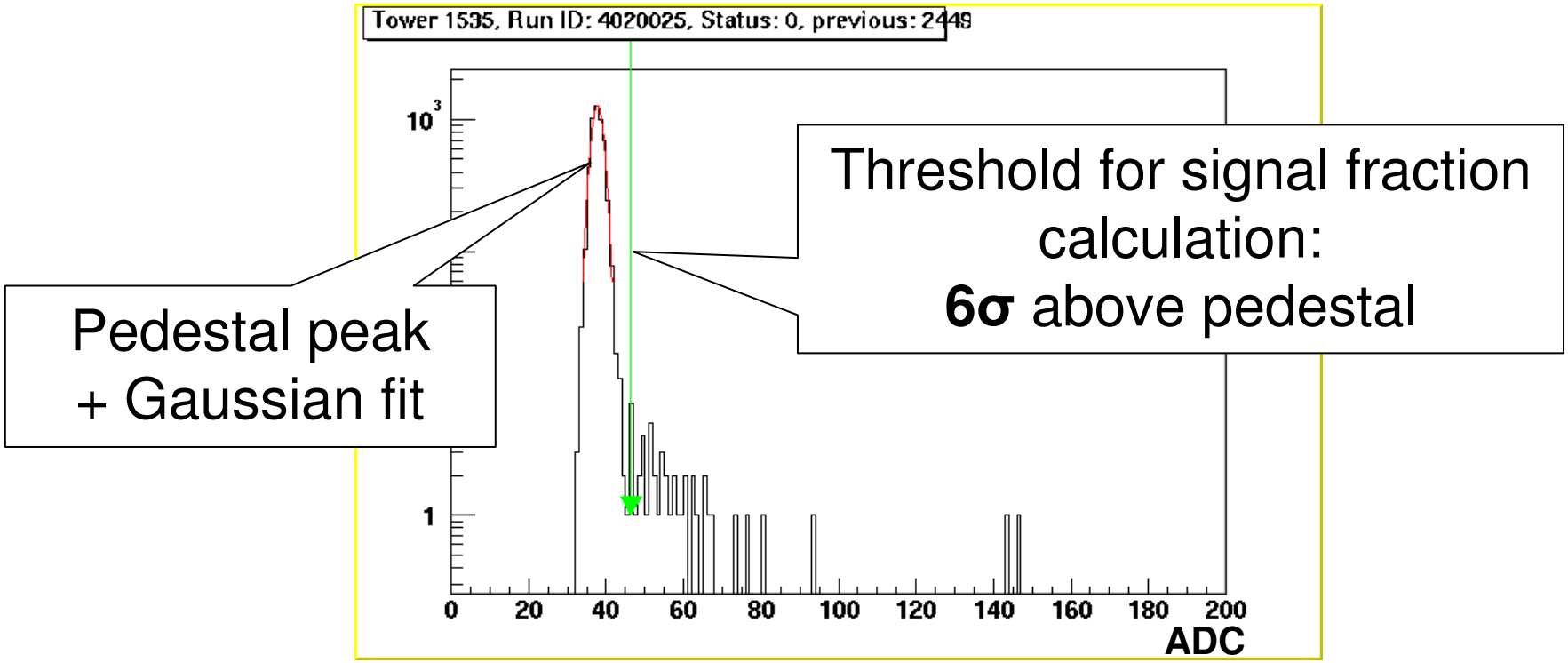
Outline

- Tower status determination criteria
- Result – set of tower status tables (2003 d-Au and p-p runs)
- SMD strip status determination criteria
- Result – set of SMD status tables (2003 d-Au run)
- Tower status for 2004 Au-Au 62GeV run
- Tower status for 2004 p-p run
- Summary

BEMC Tower Status Criteria

- Pedestal shape (σ, position, height)
- Number of signal hits / event above PED+**6σ**

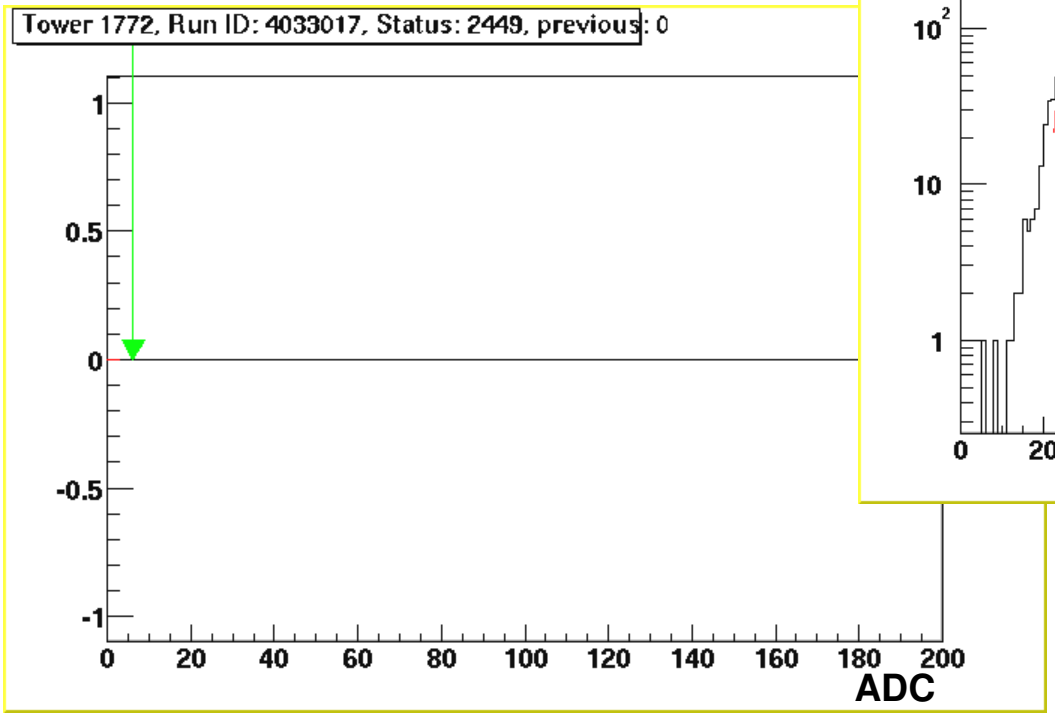
Good tower ADC spectrum (5K d-Au events)

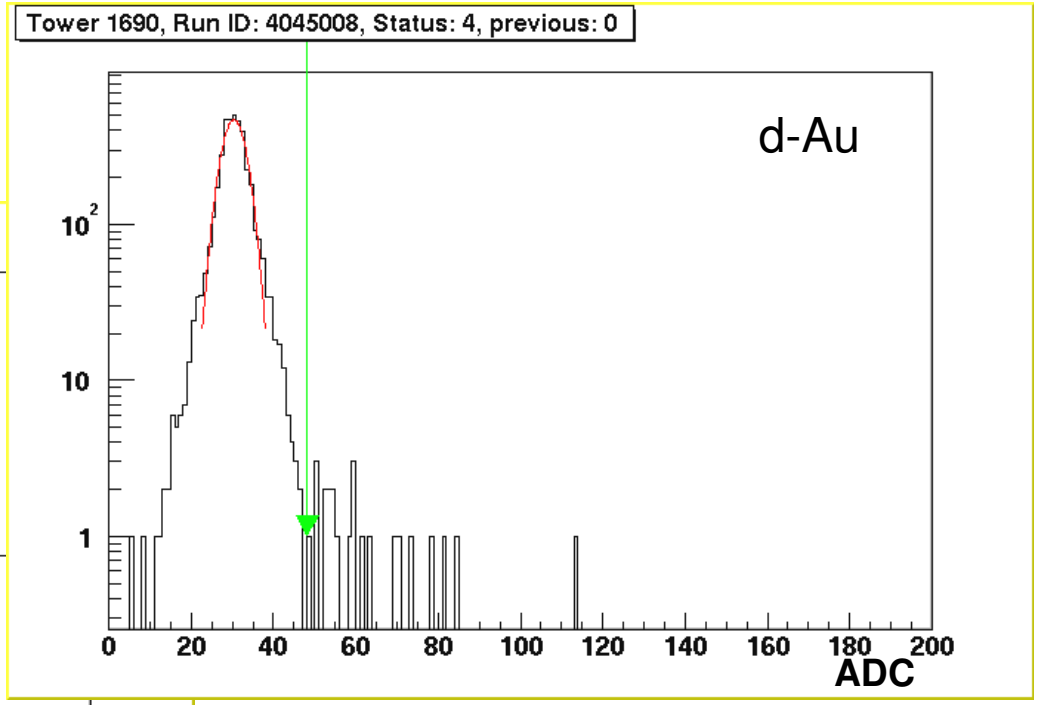


BEMC Tower Status Criteria

Pedestal shape

No pedestal



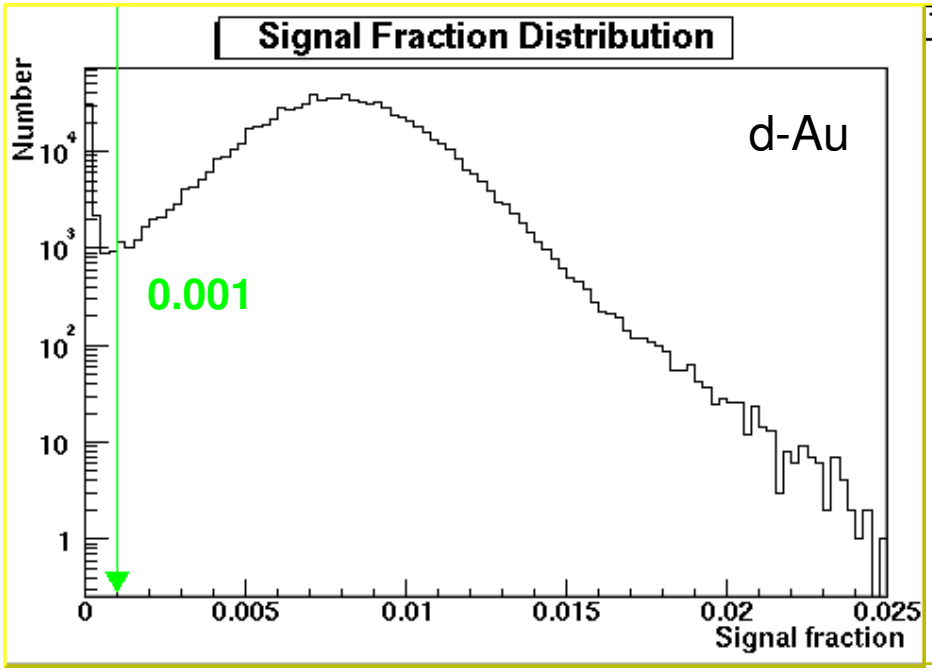


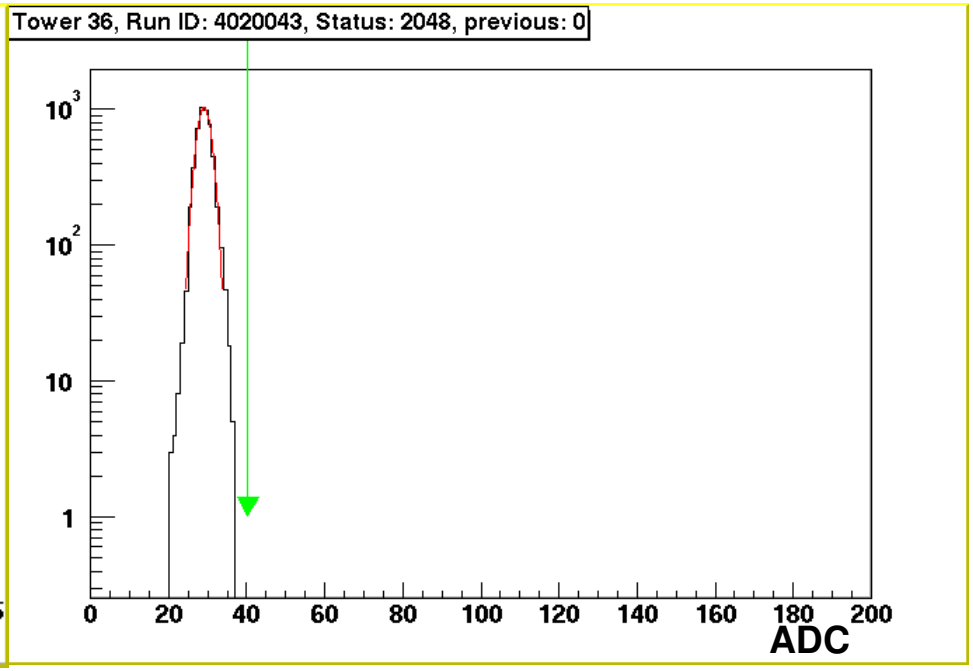
Pedestal is too broad

σ > 3

BEMC Tower Status Criteria

Signal fraction



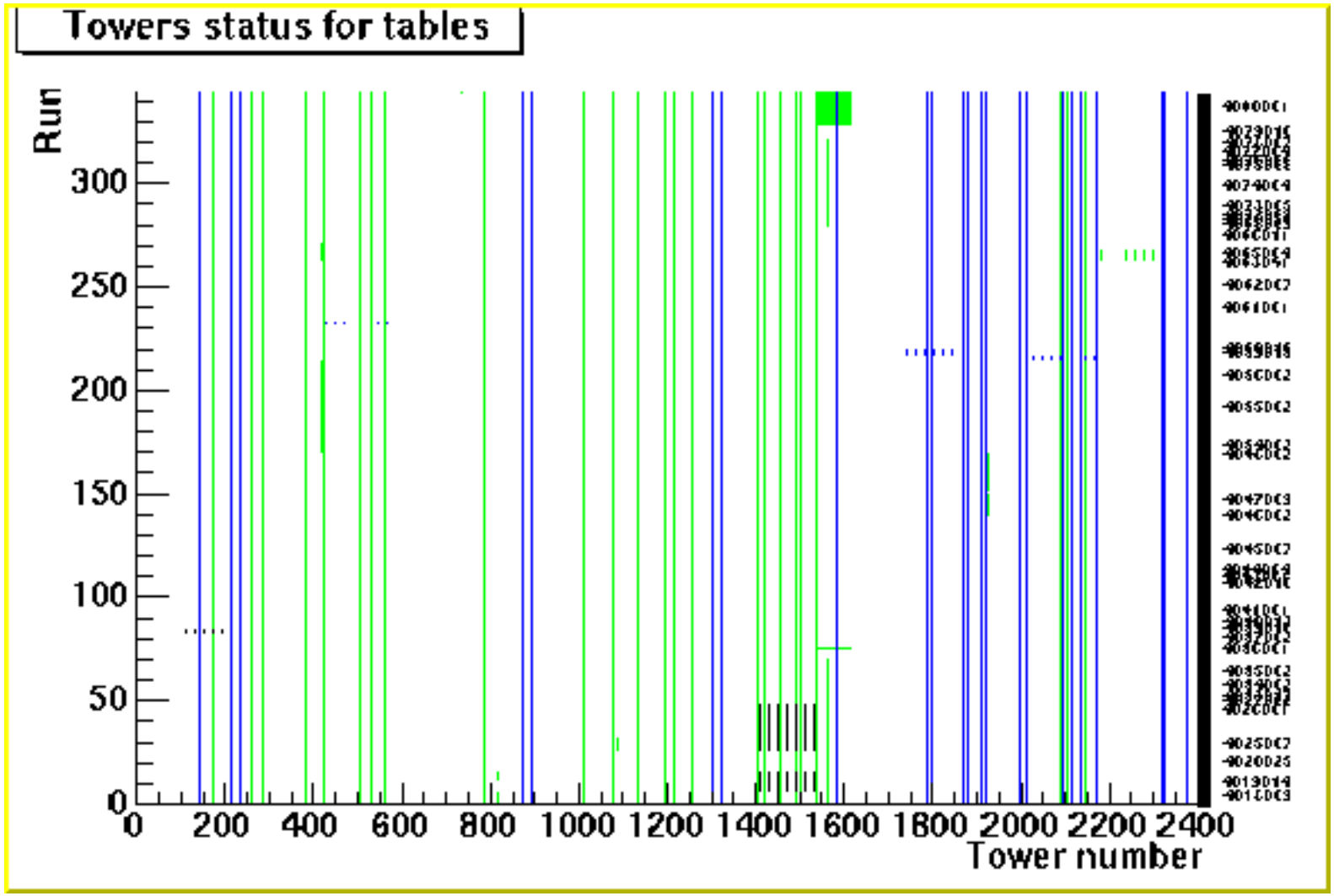


0.001 < signal fraction < **0.03** for **d-Au**

0.00015 < signal fraction < **0.01** for **p-p**

Example:
No signal, pedestal only

BEMC Tower Status – 2003 d-Au

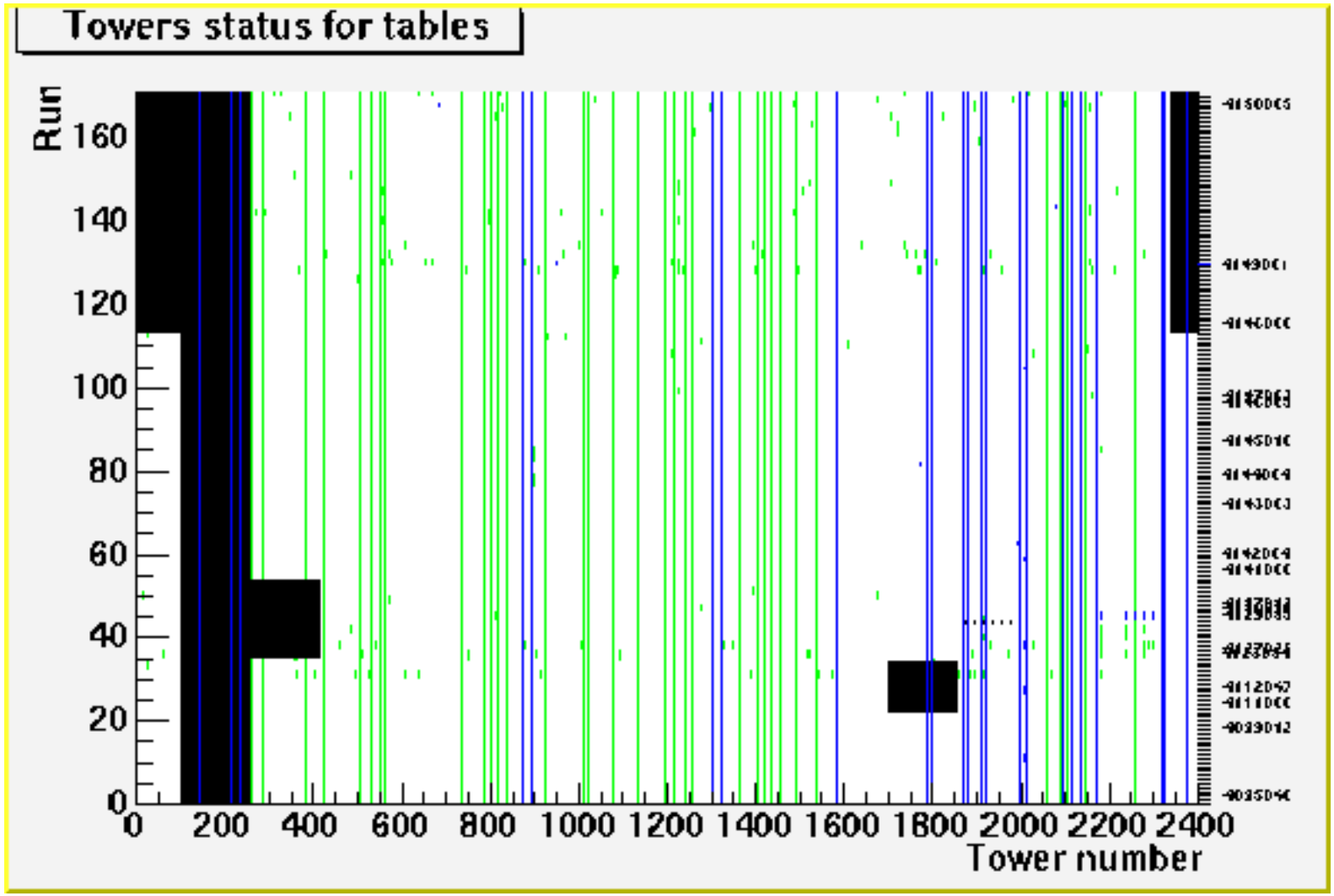


Legend:

- Off
- Cold
- Bad

Bad towers:
240 (**10%**)

BEMC Tower Status – 2003 p-p



Legend:

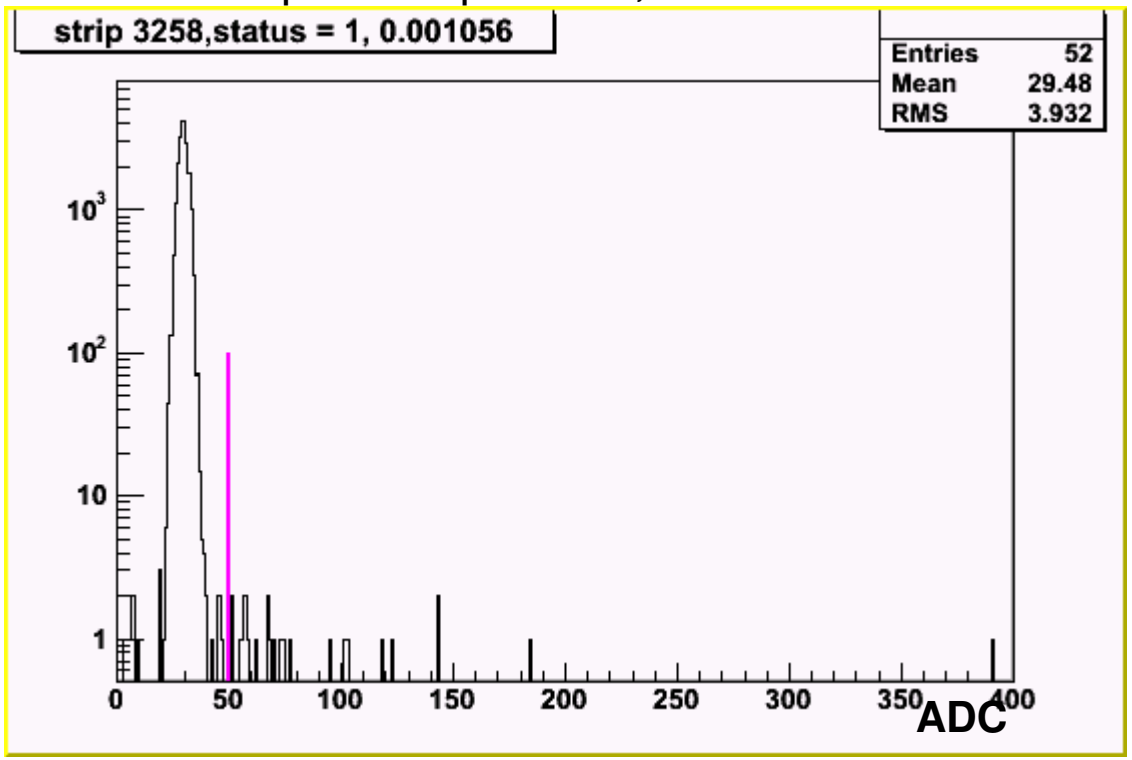
- Off
- Cold
- Bad

Bad towers:
453 (**19%**)

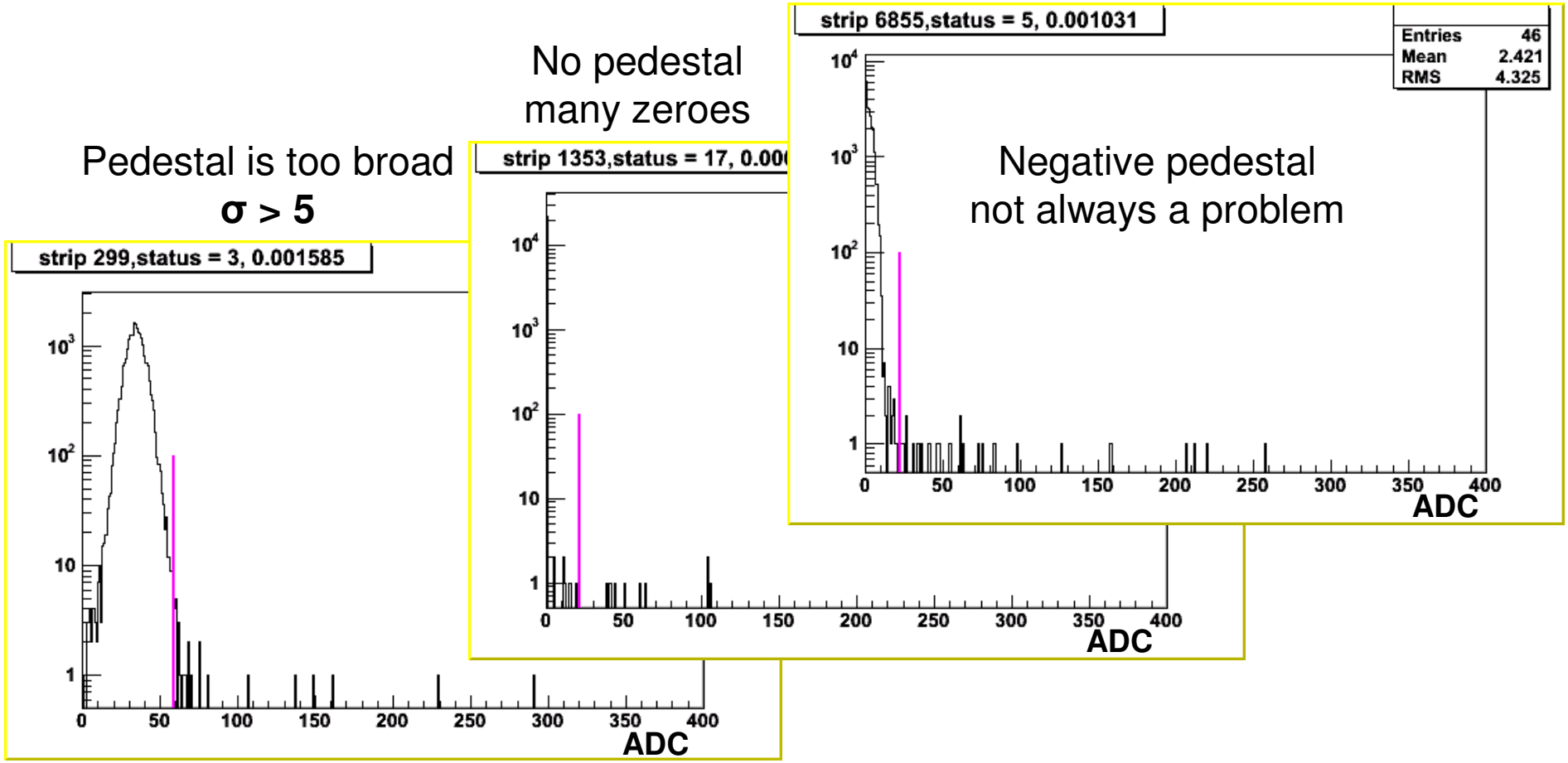
BSMD Strip Status Criteria for 2003 d-Au (by Martijn Russcher)

- Pedestal shape (σ, position)
- Signal fraction: above PED+**20** or PED+**4σ**

Good strip ADC spectrum, 25K d-Au events



BSMD Strip Status Criteria
Pedestal shape

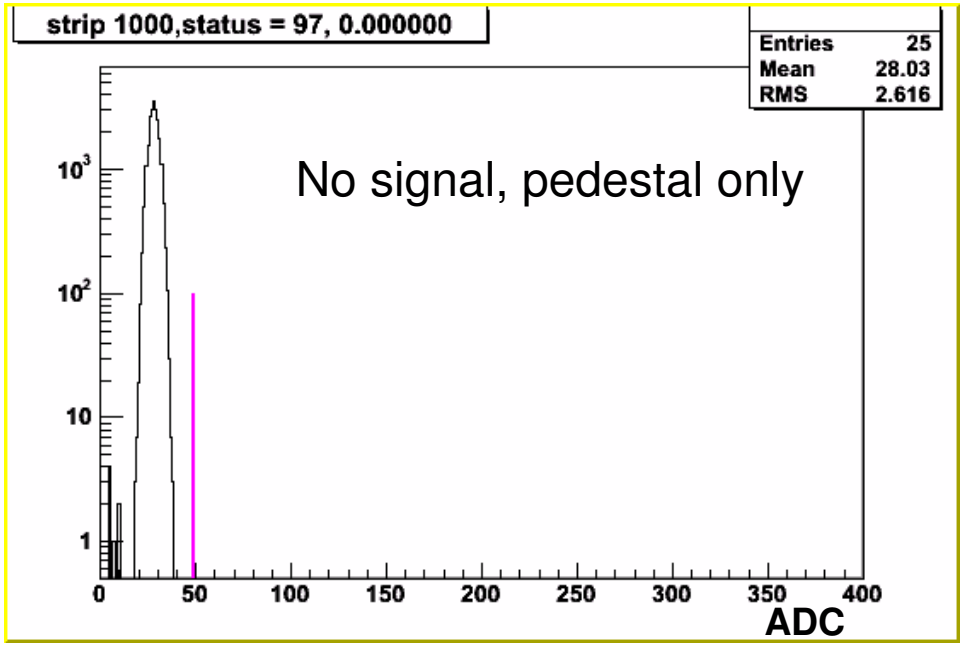


BSMD Strip Status Criteria

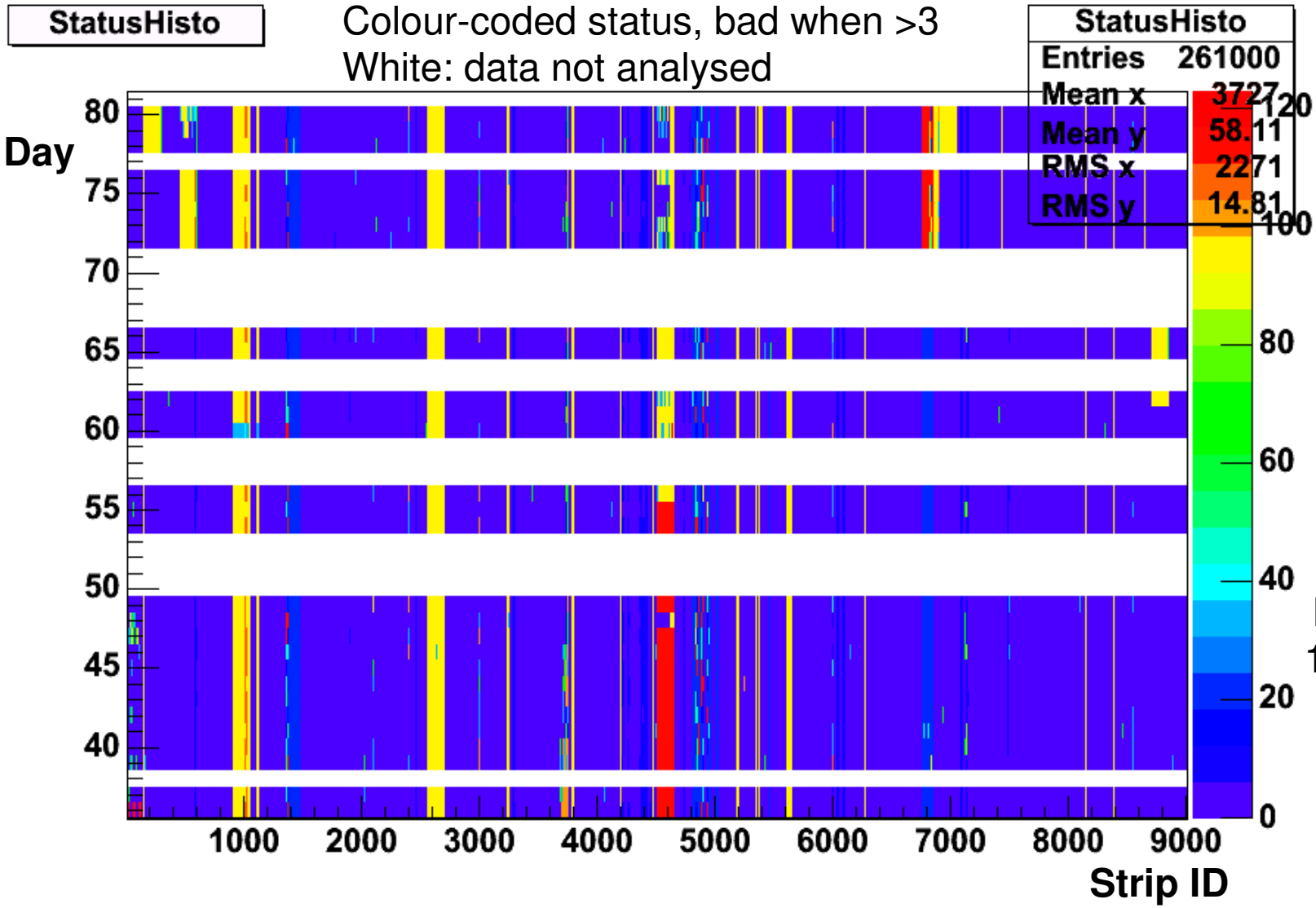
Signal fraction

Number of hits / event above PED+**20** or PED+**4σ** if σ>5
Fixed threshold used to make it flat in η while σ changes

0.0002 < signal fraction < **0.005**

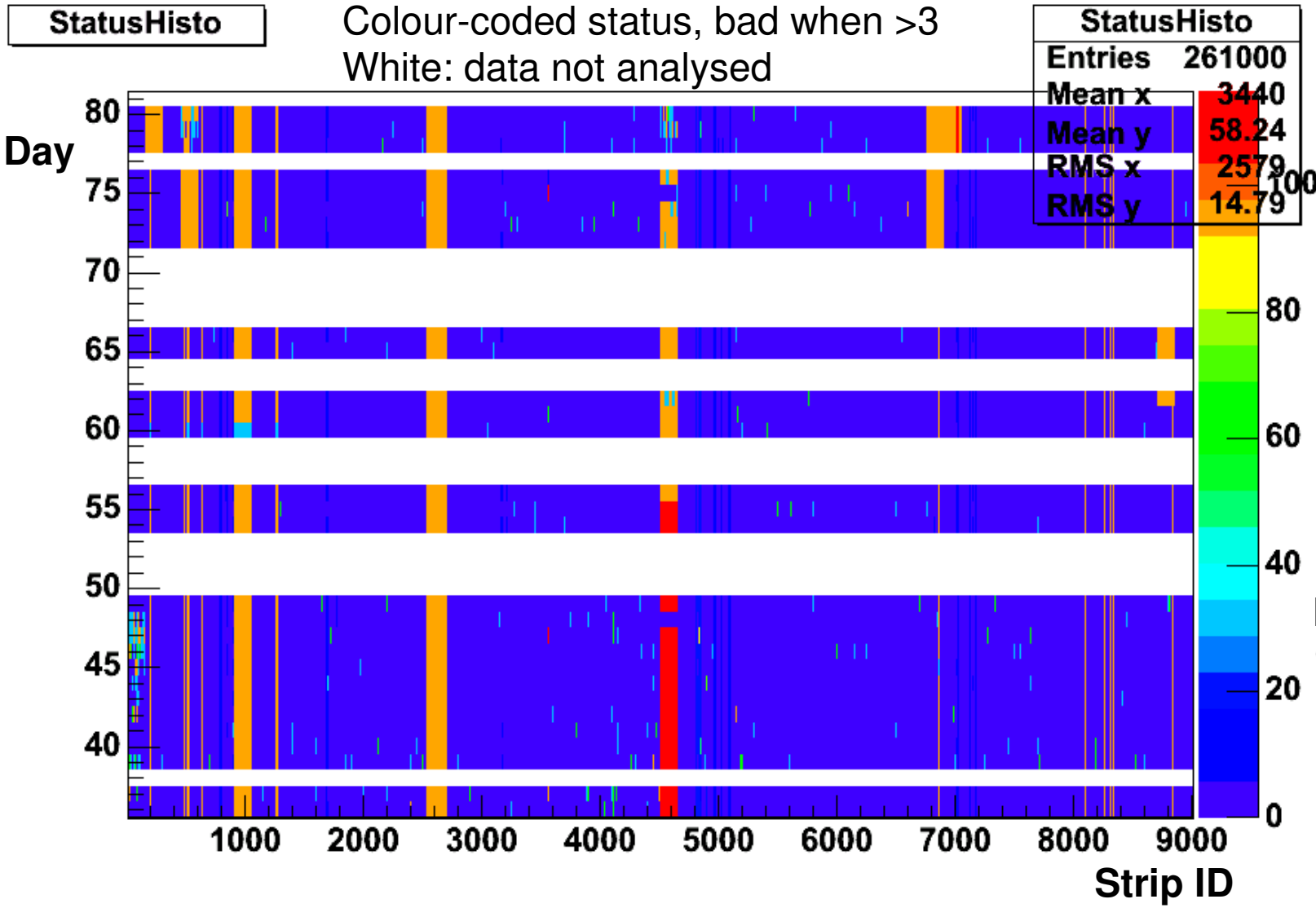


BSMD-eta Strip Status – 2003 d-Au



Bad strips:
1400 (**16%**)

BSMD-phi Strip Status – 2003 d-Au

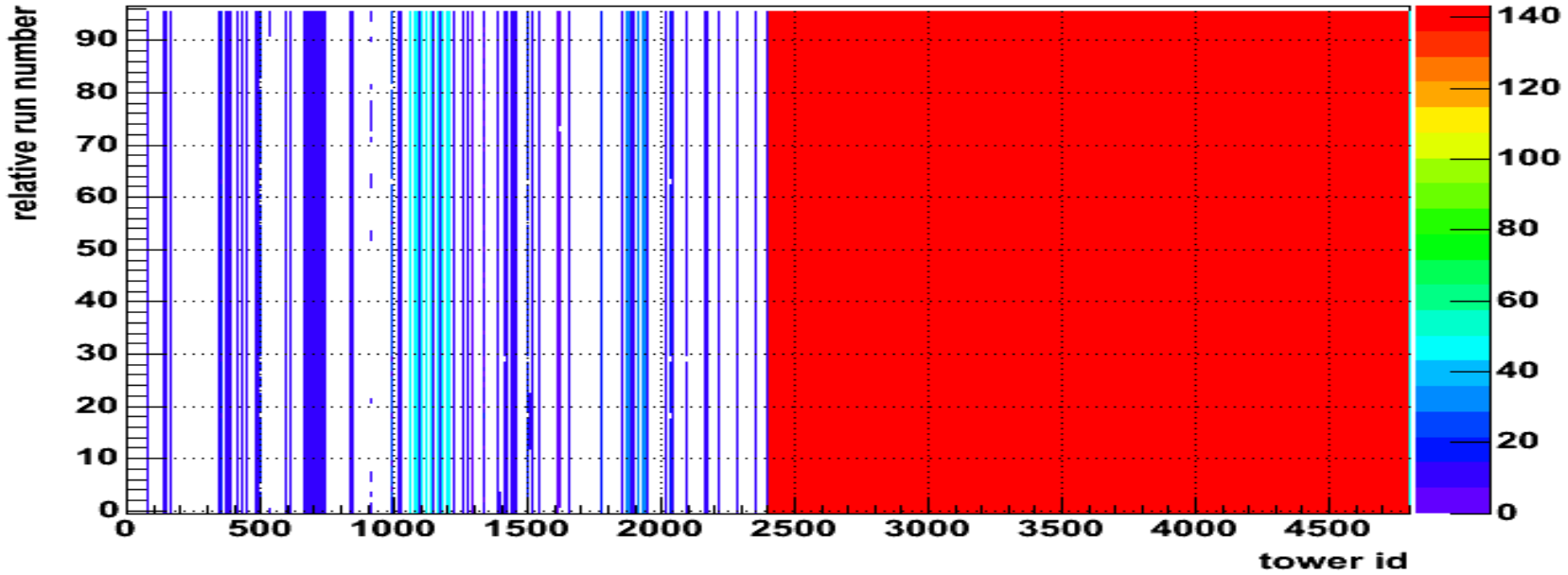


Bad strips:
900 (**10%**)

2004 Au-Au 62GeV Run Tower Status

By Thorsten Kolleger:

- Similar set of quality checks
- 8.4% of bad towers
- BEMC was quite stable (within 0.1%)



2004 p-p Run
Tower Status

By David Relyea:

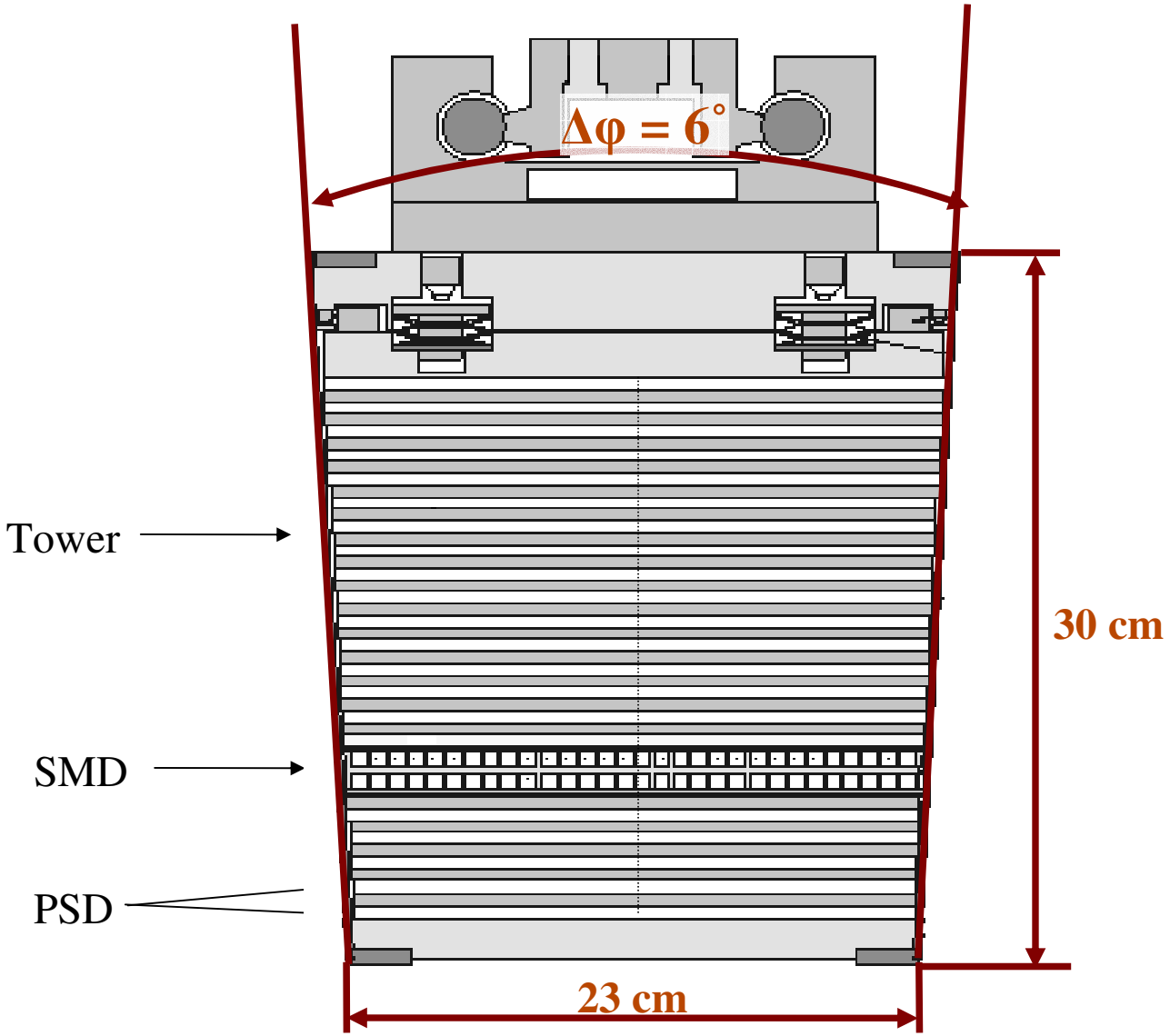
- Similar set of quality checks
- Small fraction of data analysed
- 15-20% of bad towers

Summary

- Tower status tables produced
  - 2003 d-Au and p-p
  - 2004 Au-Au 62GeV and p-p
- SMD status tables produced
  - 2003 d-Au
- 2003 d-Au tower and SMD status tables were checked in π^0 analysis (both real data and MC simulation) and put into DB

The End

Module front view



BEMC Tower Status – d-Au

Some cleanup:

- No signal at a certain run → good at that run
- Signal fraction ~ threshold → cold all the time
- Bad > 20% of time → bad all the time
- No signal > 50% of time → cold all the time

+ 120 bad towers from 2003 LED test
(Stephen T., Alex St.)

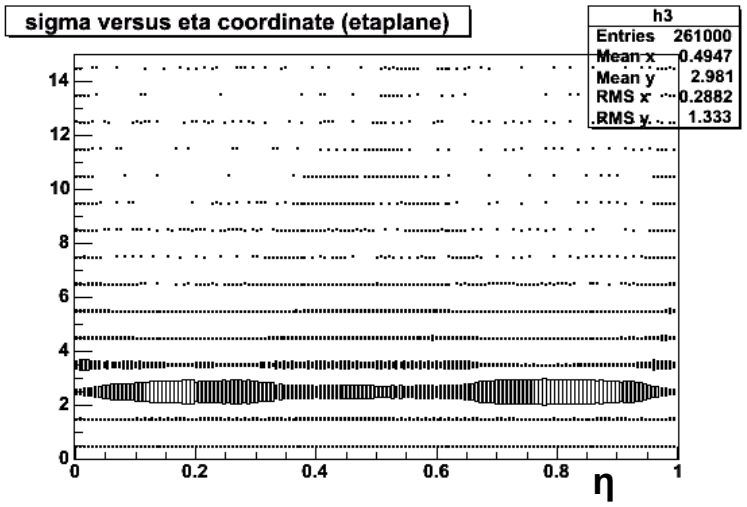
BEMC Tower Status Tables

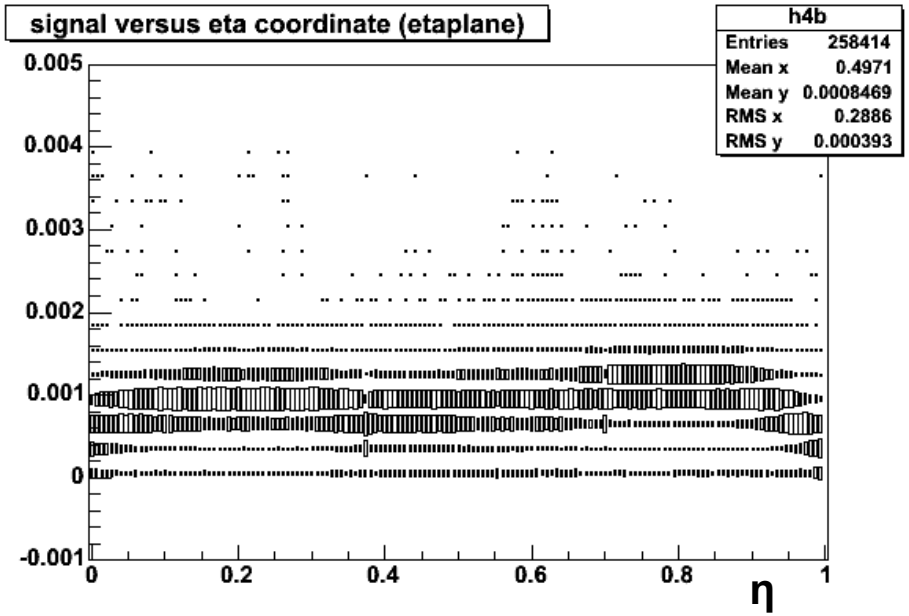
Status table: array of status codes (one per tower) with timestamp used in reconstruction, simulation and efficiency/acceptance calculations

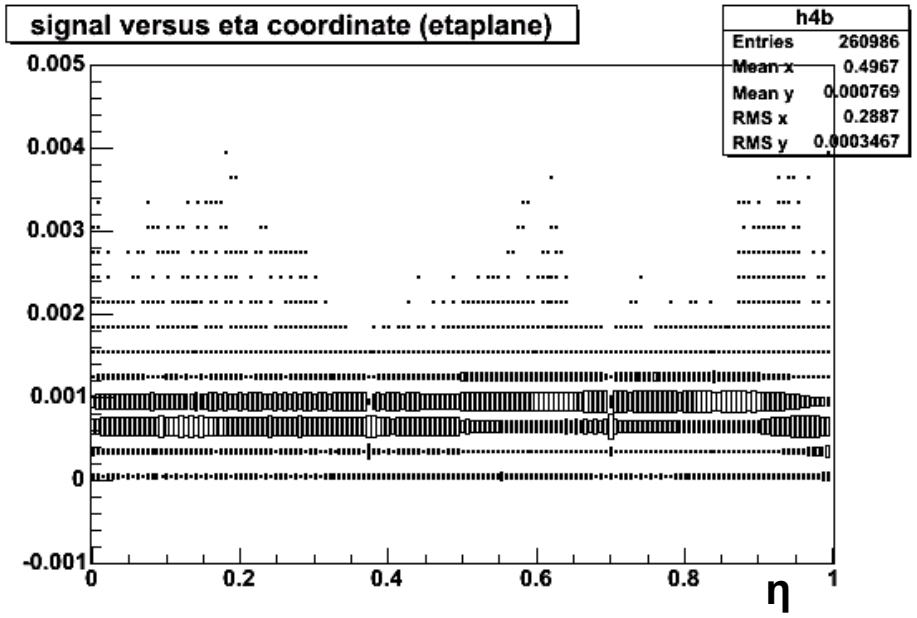
- 2003 d-Au:
  - 48 tables / 84 days: exact detector status
  - 1 table for d-Au: ~0.5% acceptance uncertainty
- 2003 p-p:
  - 100 tables / 67 days: exact detector status
  - 1 table for p-p: ~1.5% acceptance uncertainty

BSMD-eta

PED+20 vs. PED+4σ

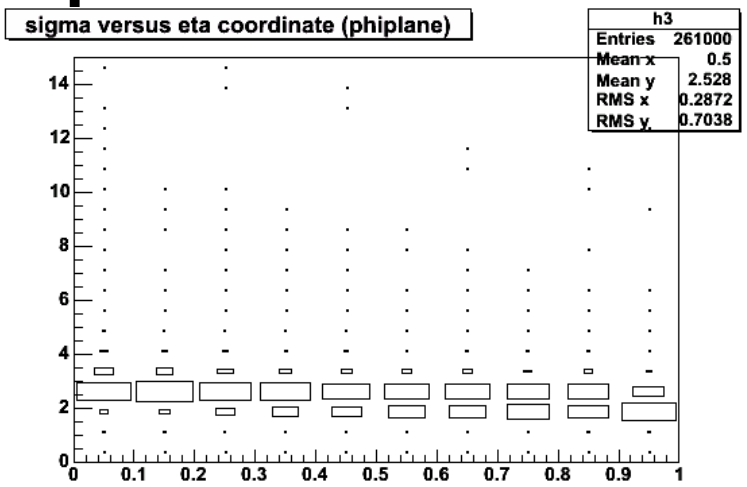


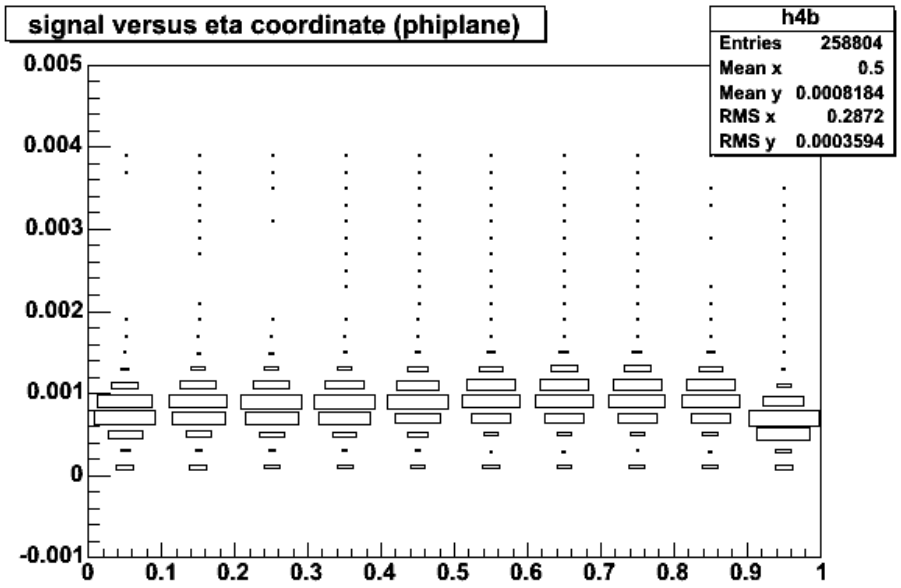


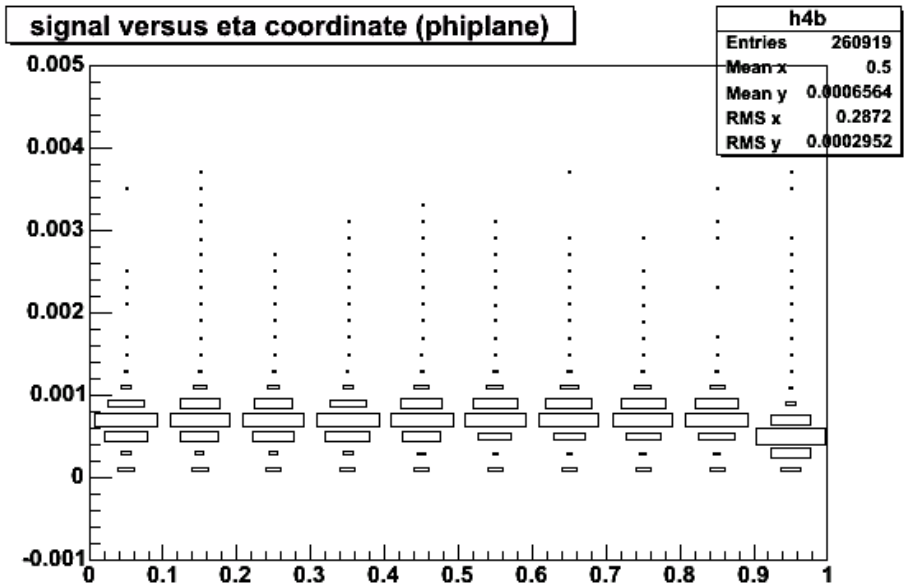


BSMD-phi

PED+20 vs. PED+4σ

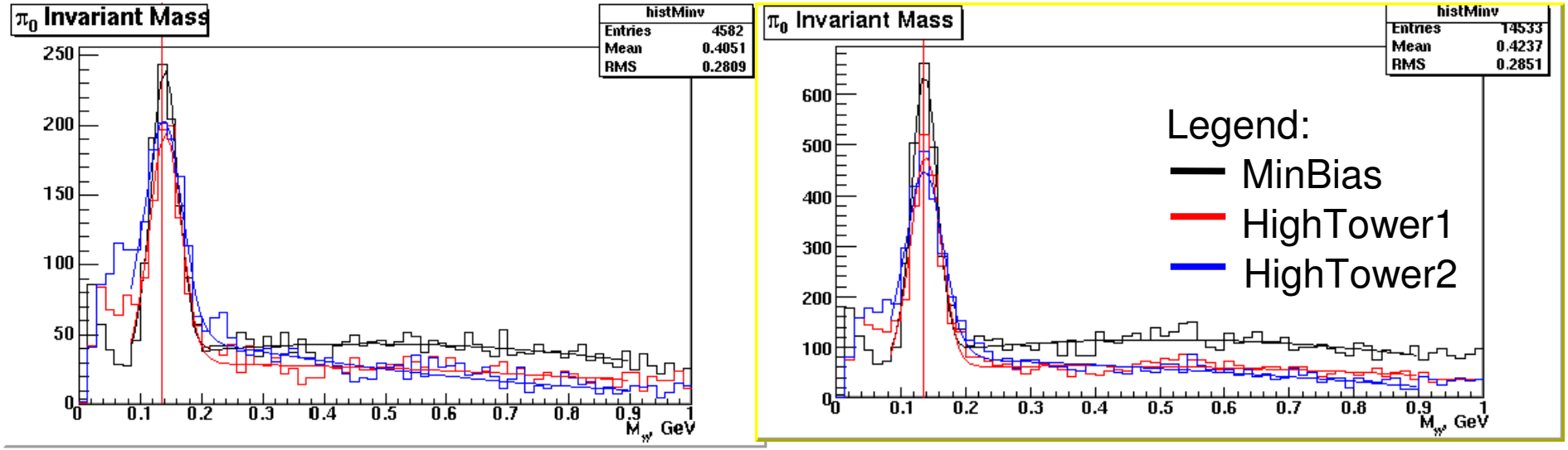






π^0 analysis with 2003 d-Au status tables

- Improvement in the π^0 invariant mass spectrum



Inv. mass spectrum with default status tables

With these tables

- MC simulation gives 76% detector acceptance