MET sub group

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Winter Physics Workshop
2004/02/22

MissingET status

- Status of the missingET package
- Status of the JetMet run/LBN selection
- post-shutdown data

missingET package

- Missing ET package in the d0correct framework (v00-00-06) provide corrected missing ET :
  - ✓ JES correction
  - ✓ EM correction
  - ✓ Muon correction
- Functions on TMB and tmb_tree :
  - ✓ GetMETBCorrCALO() GetMETACorrCALO()
  - ✓ GetMETBCorrCALOMU() GetMETACorrCALOMU()
  - ✓ documentation :

http://www-d0.fnal.gov/computing/algorithms/calgo/met/met_cor_doc.html

- We need feedback from physics group :
  - ✓ do you use it ?
  - ✓ do you have any problem with MET corrections ?

missingET package

✗ missing ET package has been upgraded for next d0correct version :

- ✓ v00-06-12

✗ Treatment of bad jets :

- ✓ provide functions to remove bad jets from visible energy (=>add bad jets to missingET)
  - getMETBCorrCALOBJ() getMETACorrCALOBJ()
  - getMETBCorrCALOMUBJ() getMETACorrCALOMUBJ
- ✓ definition of these bad jets are :
  - jets which do not pass jet-ID criteria except the cut Emfrac > 0.95

✗ This treatment is not satisfactory :

- ✓ Studies are needed ...
- ✓All the informations is available on TMB or tmb_tree to remove the bad jets you want from missingET computation

JetMet run selection criteria

✗ JetMet run selection for all pre-shutdown data has been completed (Gregorio) :

- ✓ tmbfixed or p14.05.02 from raw data
- ✓ with or without T42

✗ The selection is based on the first 1000 events of a TMB file

Define the average shift:

$$\text{MET-xy} = \sqrt{[\,(\langle\text{MET-x}\rangle)^2 + (\langle\text{MET-y}\rangle)^2\,]}$$

$$\text{RMS-xy} = \sqrt{[\,(\text{RMS-x})^2 + (\text{RMS-y})^2\,]}$$

To declare a RUN "GOOD":

1) Require MET-xy < 6 GeV in all files of a run,
and MET-xy < 4 GeV in average

2) Require RMS-xy < 20 GeV in all files of a run
and RMS-xy < 18 GeV in average

3) Require scalar E_T > 60 GeV in all files of a run
and scalar E_T > 60 GeV

After JetMet Run selection

TMX fix + T42

Runs:
151817 –180896
(April 2002 - Sept 2003)

one entry / Run

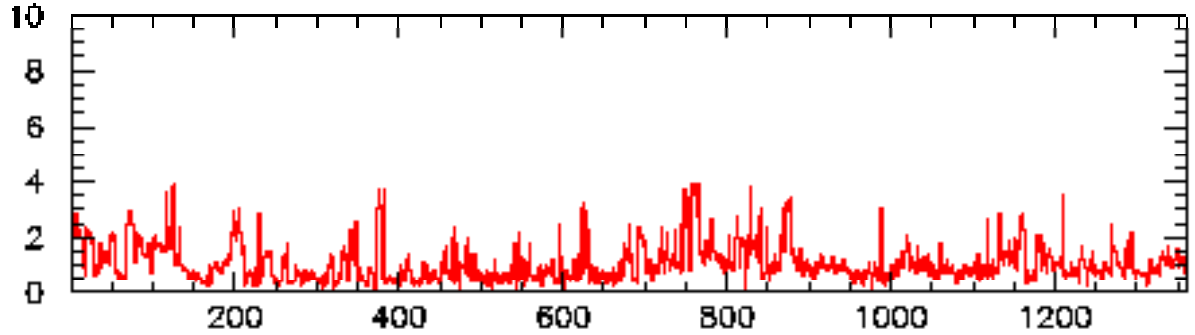
Selection: we keep

Per Run: 88%

Per File: 97%

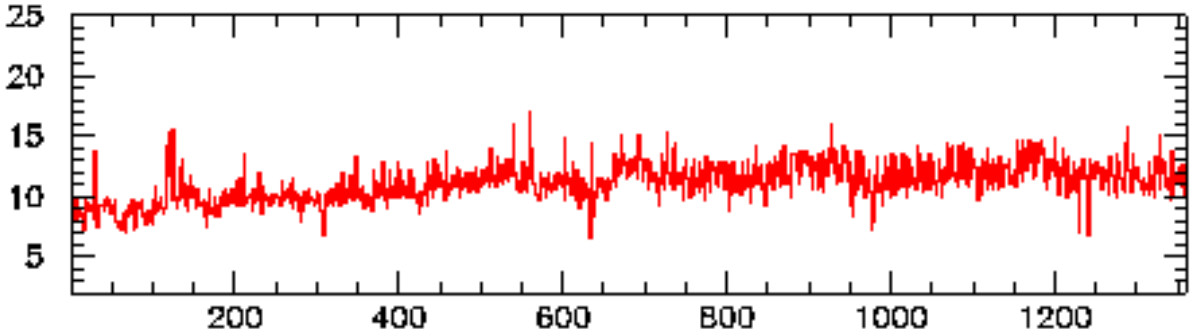
182 pb^{-1} after JETMET file/lbn sele

Met-xy Shift

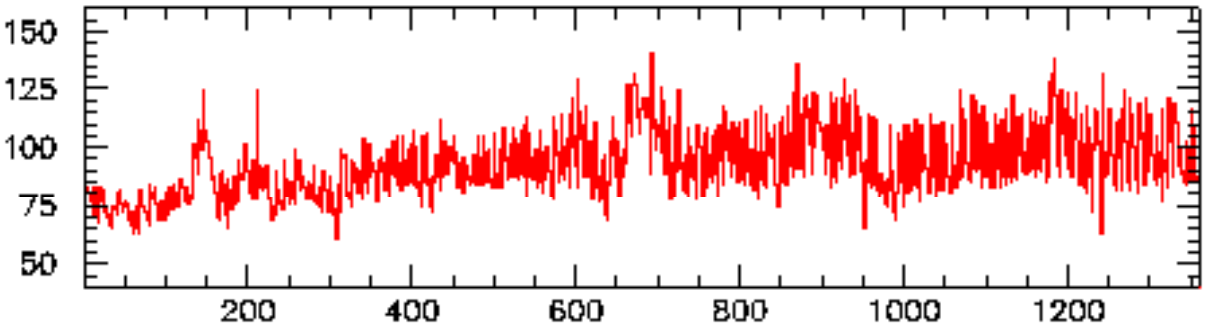


GeV

RMS Metx-y



Scalar E_T



Post shutdown data

✗ We are monitoring all D0 data available in SAM :

- ✓ The production is done remotely at CCIN2P3
- ✓ We plot missingET quantities per RUN and LBN

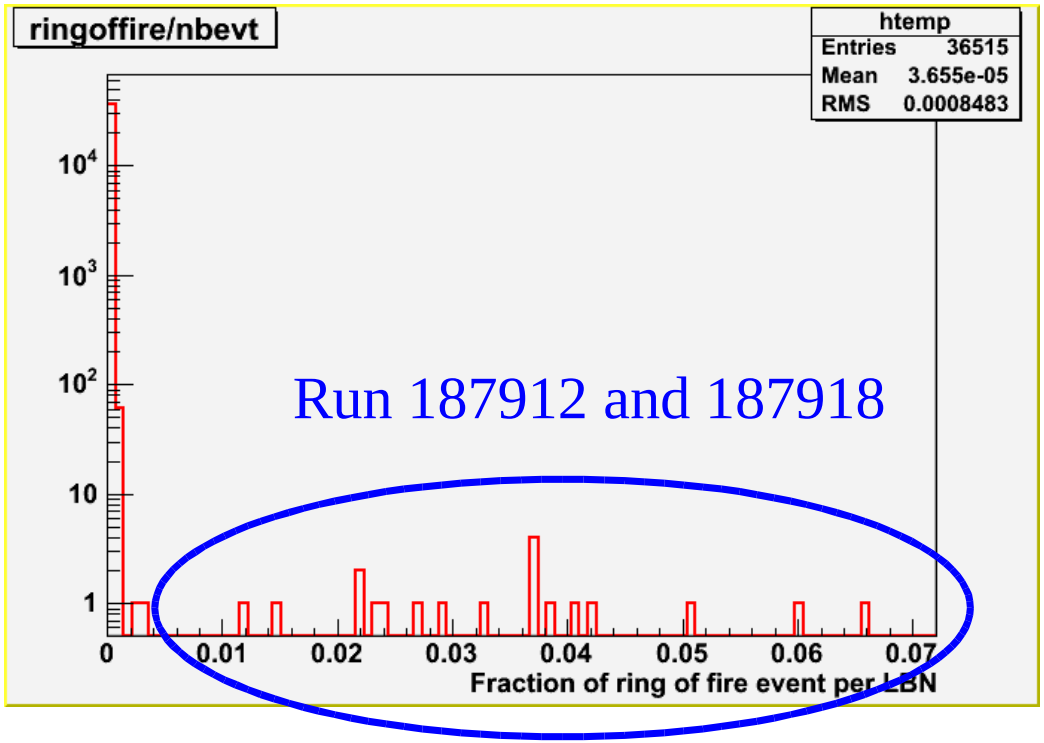
✗ Our program uses :

- ✓T42 in « killer » mode
- ✓Reconstruct JCCA/JCCB and missingET chunck
- ✓Use cal_event_quality package => event flags :
  - Empty crate
  - Coherent Noise
  - Ring Of Fire

✗ Data sample : p14.06.00 data available in SAM (04/02/10)

- ✓ 292 runs
- ✓ 36515 LBNs
- ✓ 80 millions of events

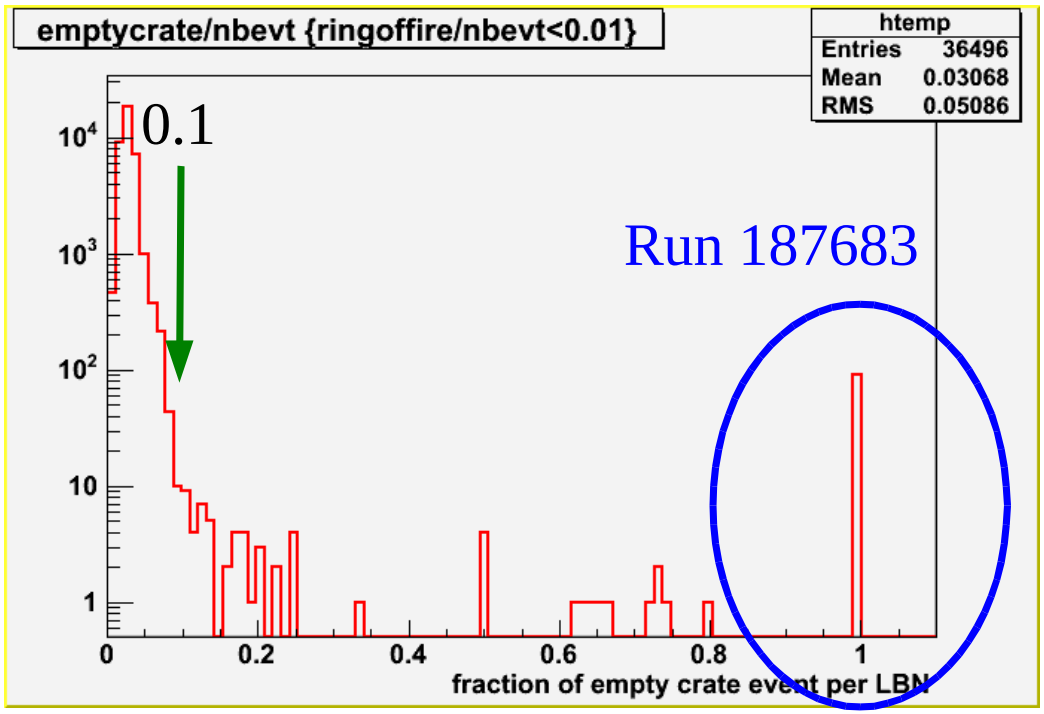
« Ring of fire » events



- ✗ some LBNs have more than 1% of their events flagged as « ring of fire »
  - ✓ they all come from two runs :
    - 187912 and 187918
- ✗ We reject these runs for the moment
- ✗ but only ~20 LBNs over 454 LBNs in runs 187912 and 187918 have this problem :
  - ✓ rejecting just LBNs instead of runs would to save 95% of these 2 runs.

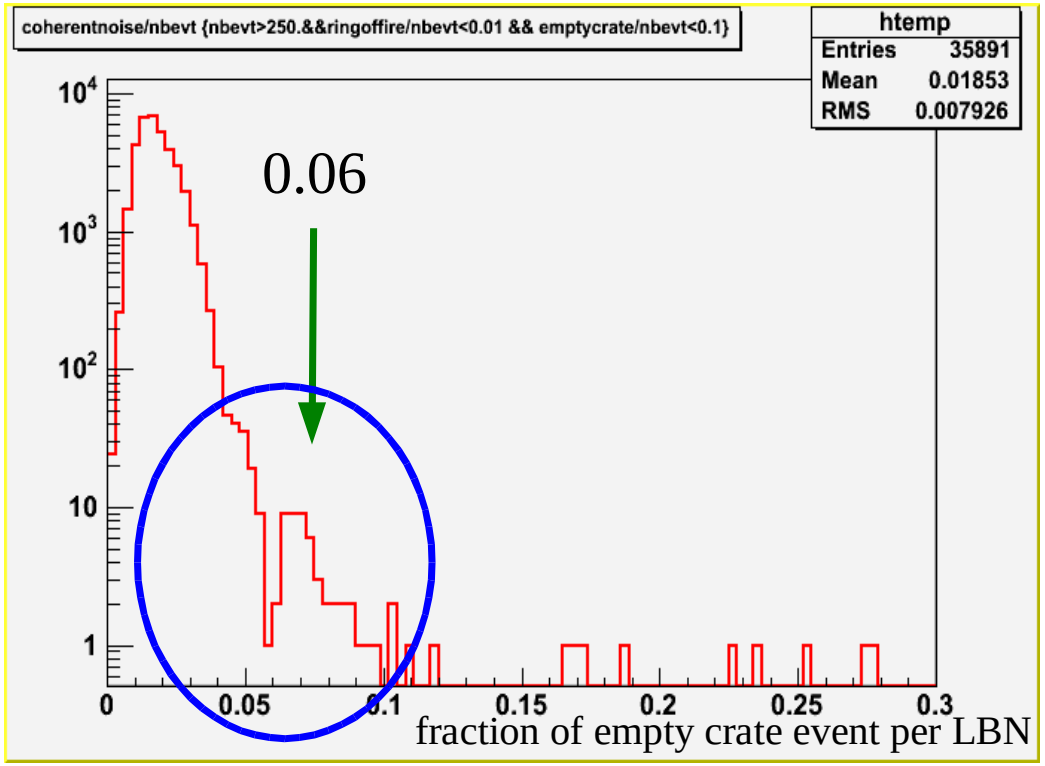
Why do we still have ring of fire events in post-shutdown data ?

« Empty crate » events



- ✗ « Empty crate » events are partly due to high event rate
- ✗ Some LBNs have more than 10% of their events flagged as « empty crate »
  - ✓ expecially run 187683 has all its event flagged
- ✗ We reject LBNs if this fraction is greater than 10 %

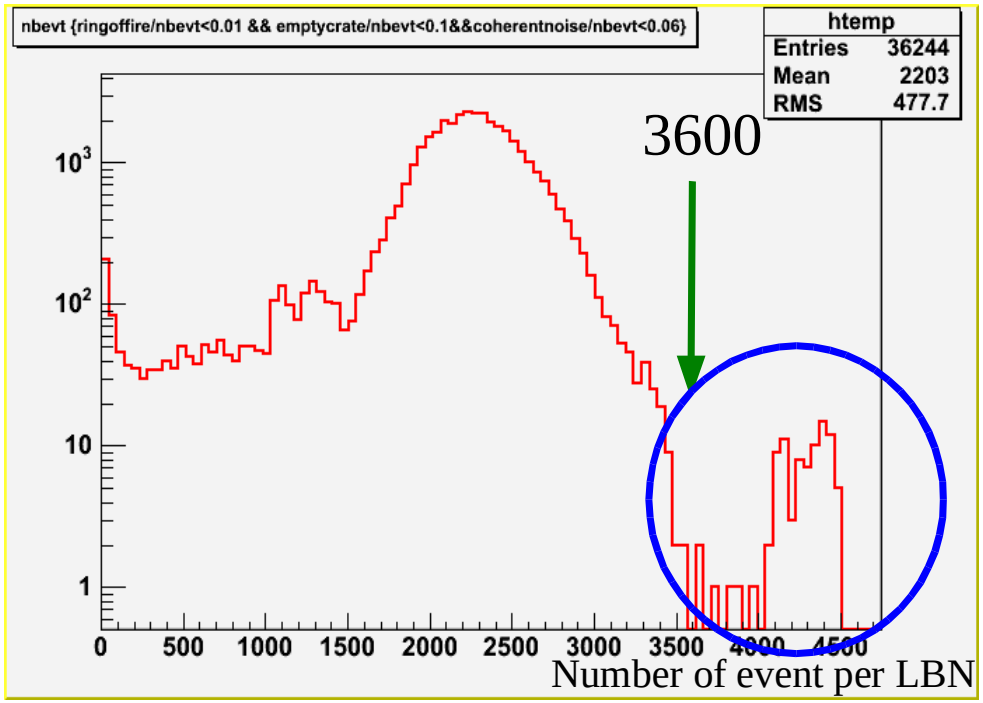
« coherent noise » events



contribution from runs 188909,188923,188924

- ✗ Some LBNs have more than 6% of their events flagged as « coherent noise »
  - ✓ contribution from runs 188909,188923,188924 in the tail
  - ✓ dq_calo show that these runs have several bad BLS
- ✗ We reject LBNs if this fraction is greater than 6 %

LBNs with high number of events

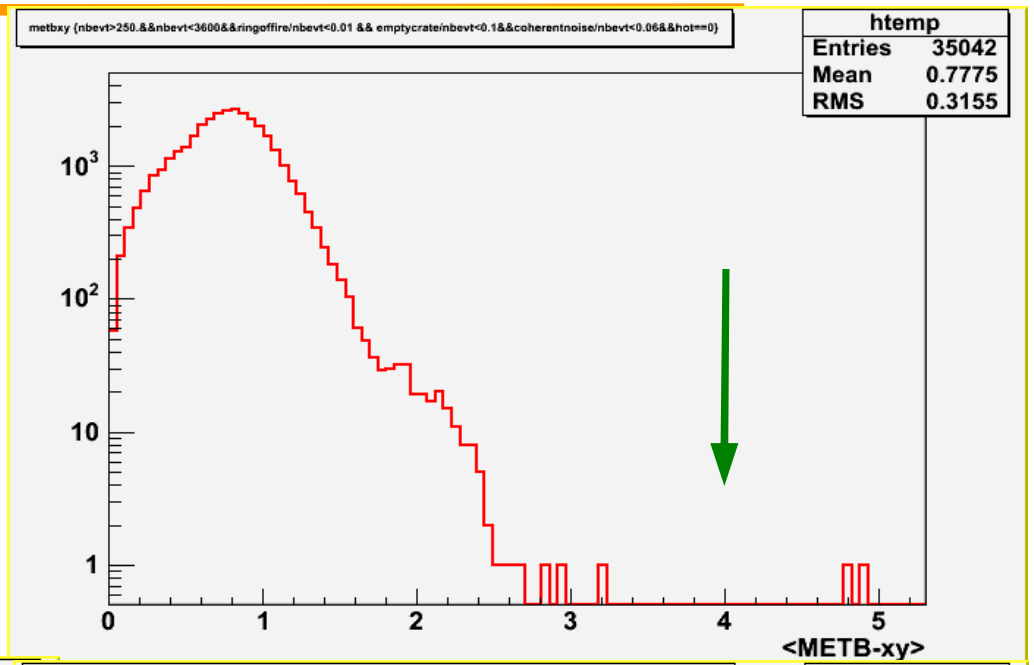


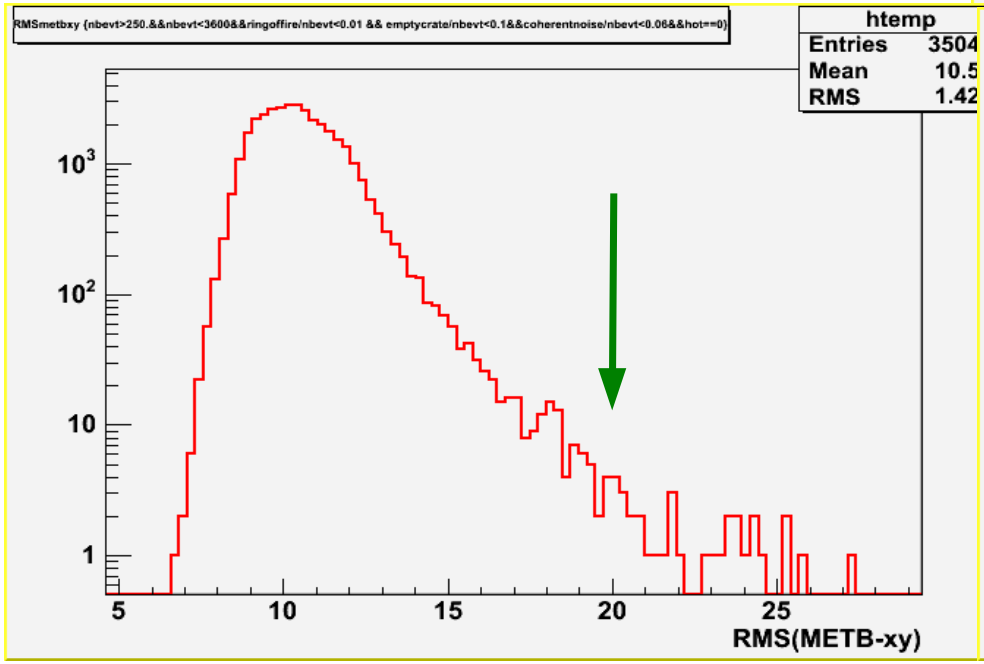
main contribution from runs
186074,186075

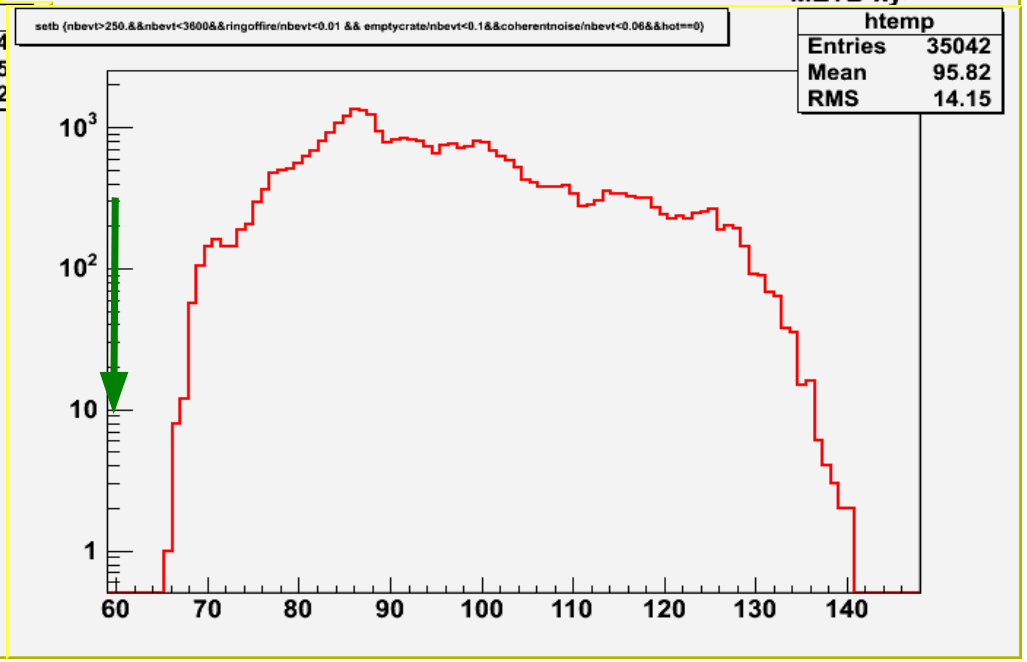
- ✗ Some LBNs have more than 3600 events :
  - ✓ main contribution from runs:
    - 186074, 186075
- ✗ Is it a calo, trigger problem ?...

JetMet Selection ?

- ✗ The arrows show the cuts performed in the JetMet selection for pre-shutdown data :
  - ✓ they remove 35 LBNs over 35042
  - ✓ => 0.1 % rejection

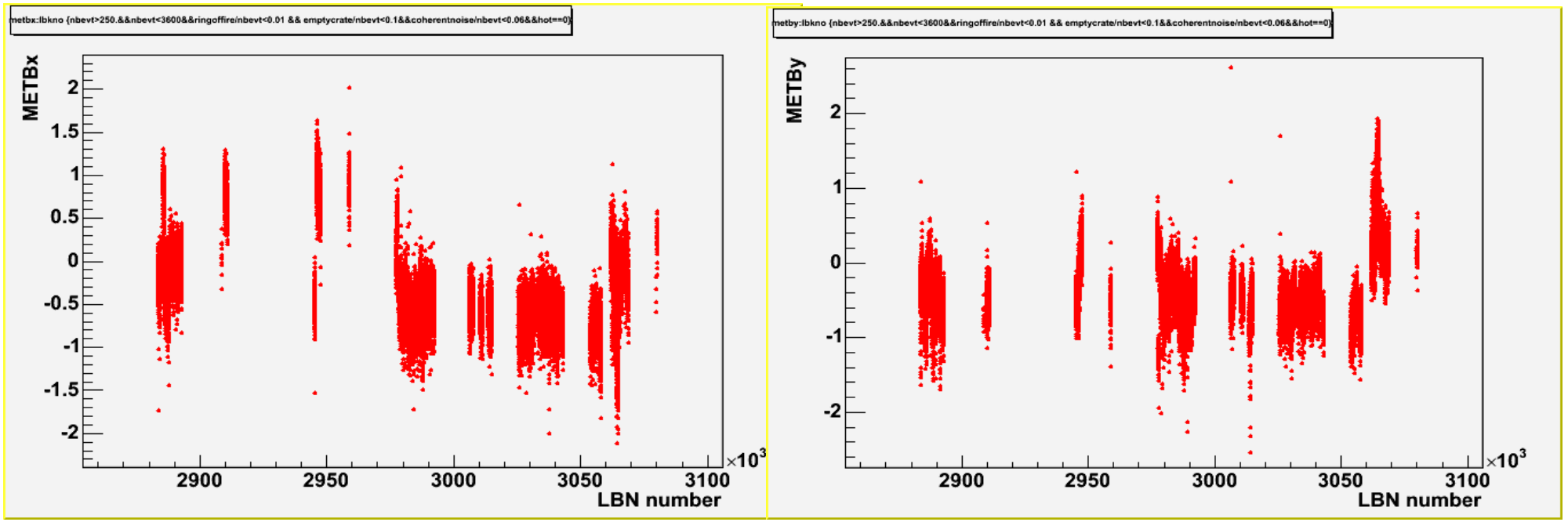






METB x and y stability

✗ average value per LBN of METB x and y as a function of the LBN number :



✗ We still have fluctuations of the order of 1 GeV

Conclusion

- ✗ missingET package is ready for next d0correct release
- ✗ JetMet runselection for pre-shutdown data is available (with or without T42)
- ✗ post-shutdown data :
  - ✓ We now have the tools to correct the calorimeter data (cal_corr_dst), and to identify (dq_calo) or reject (cal_event_quality) bad data.
  - ✓ And we are able to understand why we reject data
  - ✓ The JetMet LBN/run selection can be performed using these tools

cut	# LBN	# event	fraction of event
no cut	36515	80179520	1
identified bad run	35646	78286386	0.9764
LBN selection with cal_event_quality	35042	77838585	**0.9708**
cal_event_quality event flag	35042	74254566	**0.9261**