Calorimeter Quality of the Moriond Sample (after TMBfix Pass1; with & w/o T42)

G. Bernardi for CALGO

Criteria

From Runs to LBN's

Run selection on pass-1
noT42 (5.0) & T42 (5.1)

Effect of T42

NOTE that CALO has 2 ways to classify data quality:

1) Hardware level (CAL)

2) Offline/ "Physics" level (JETMET)

JetMet Run Selection Criteria

Define the average shift:

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

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

NoT42 ⇩
(75)
(75)

NB: Condition 1 is the most important and the most discriminant since MET-xy must always be close to 0: Conditions 2 and 3 are lumi dependent, and are used only for "cleanup".

To declare a LBN "BAD": if it belongs to a BAD file (1 file=10 LBN)

How are the data after the fix?

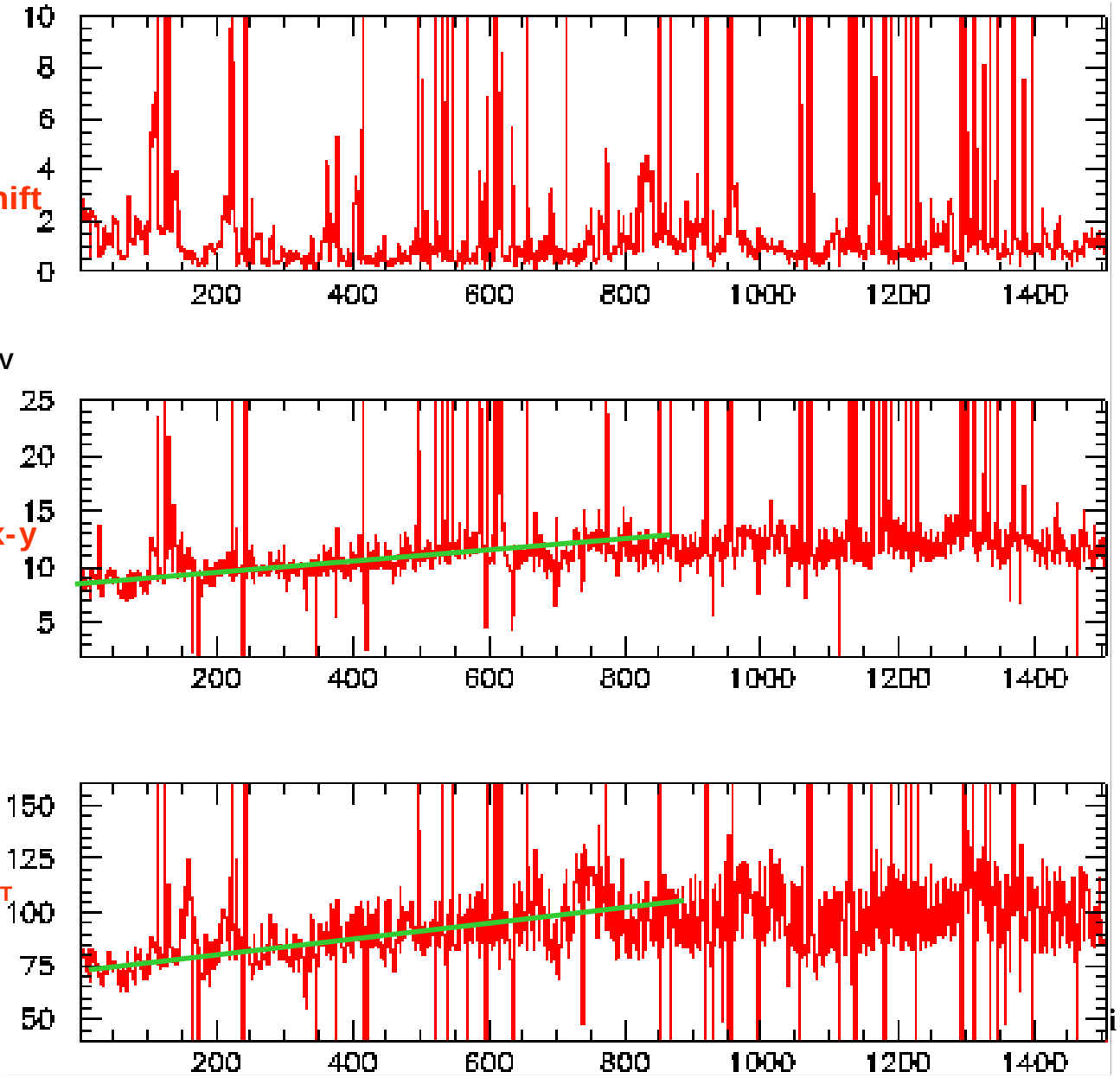
TMB fix + T42

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

one entry / Run

Note that RMS-MET And SET are lumi/trigger version dependent.

Shift-xy much less



How are the data after the fix?

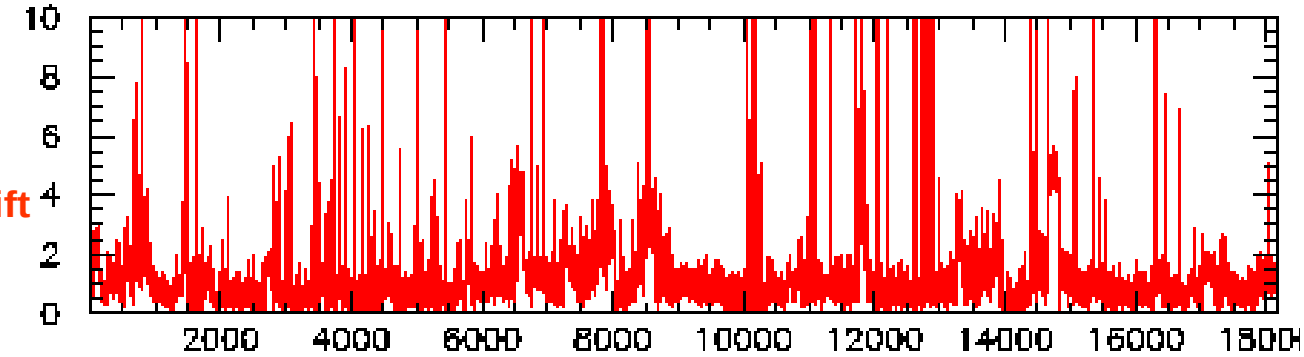
TMB fix + T42

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

one entry / File

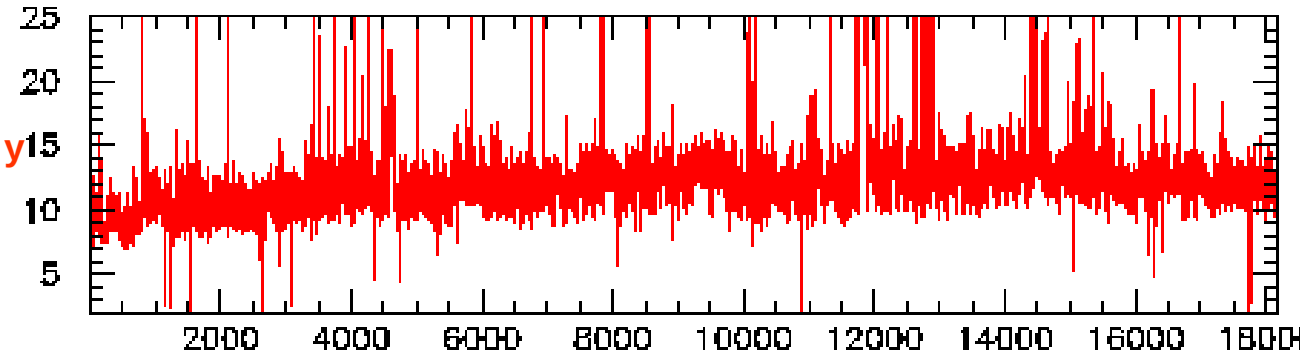
(About 10 LBN's)

Met-xy Shift

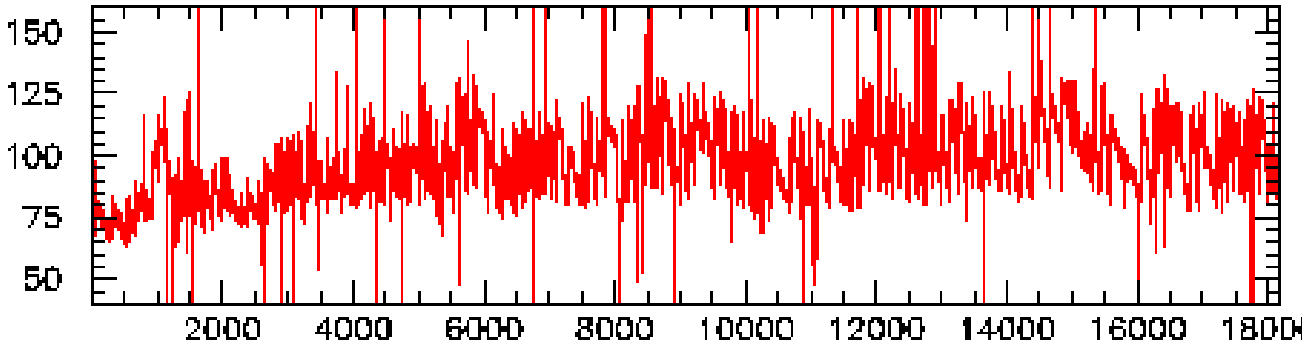


GeV

RMS Metx-y



Scalar E_T

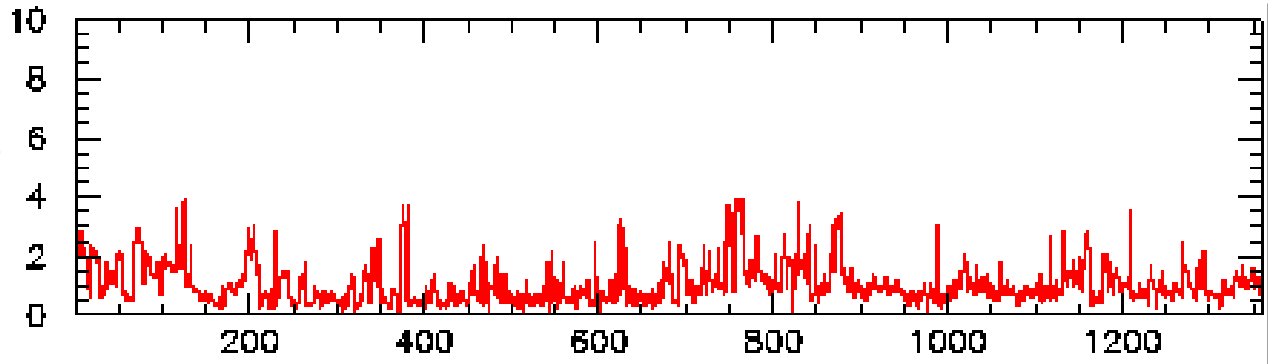


After JetMet Runselection

TMB fix + T42

Met-xy Shift

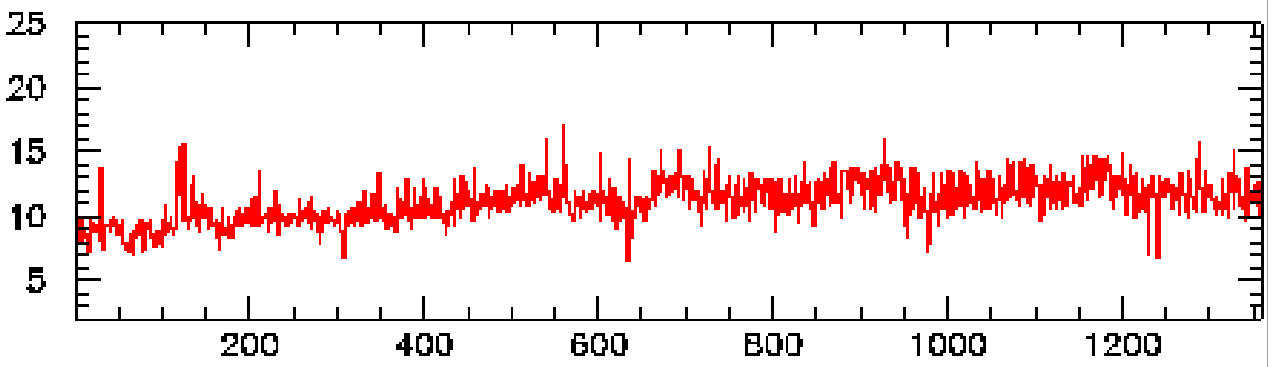
Runs:
151817 –180896
(April 2002 -
Sept 2003)



GeV

RMS Metx-y

one entry / Run



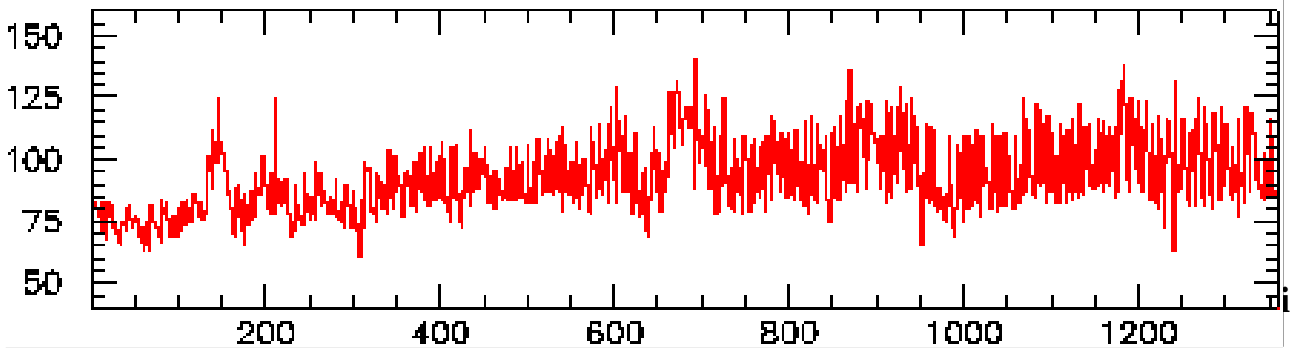
Selection: we keep

Per Run: 88%

Per File: 97%

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

Scalar E_T

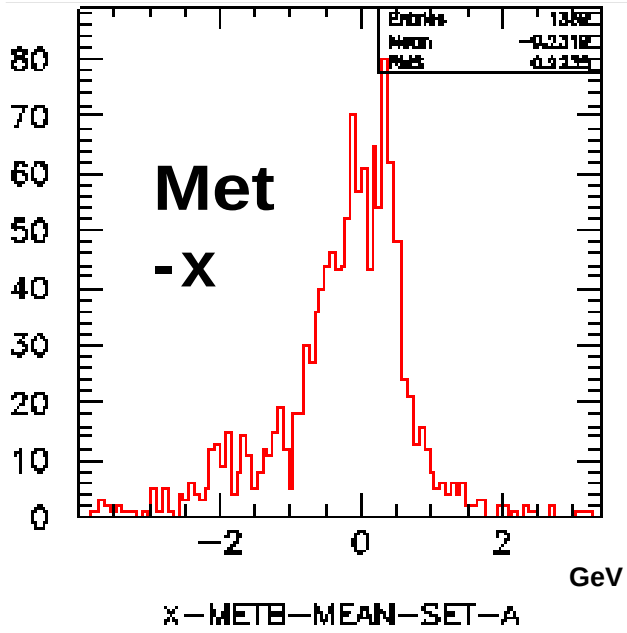


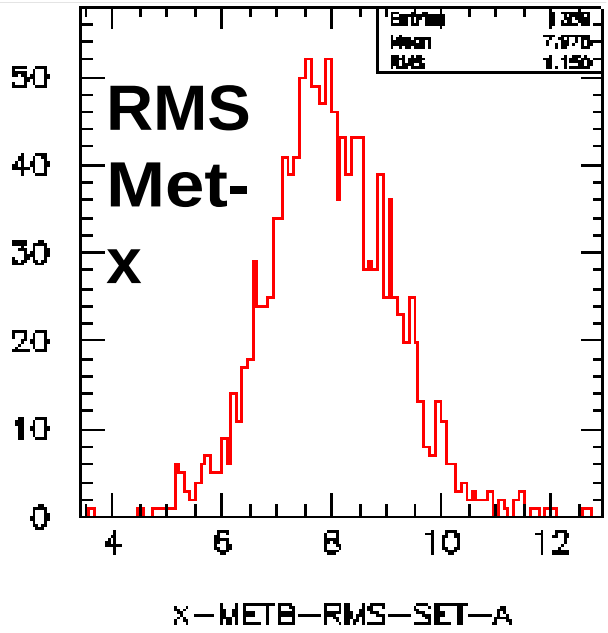
xy-shift in Missing E_T, xy-rms

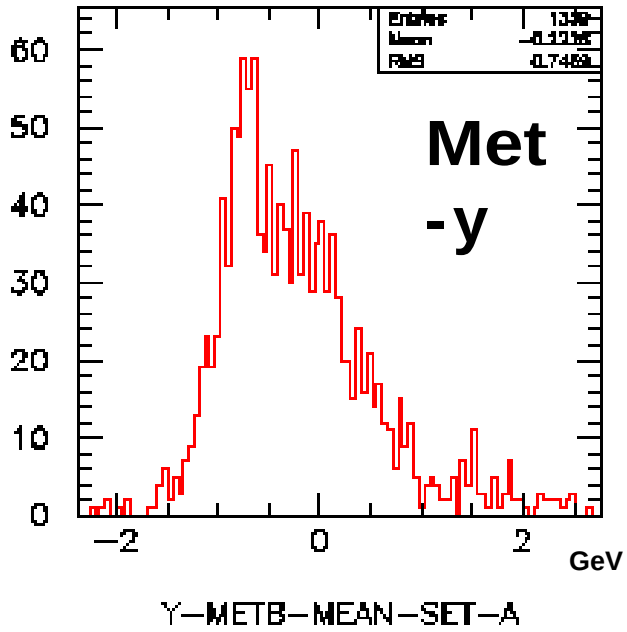
TMB fix + T42

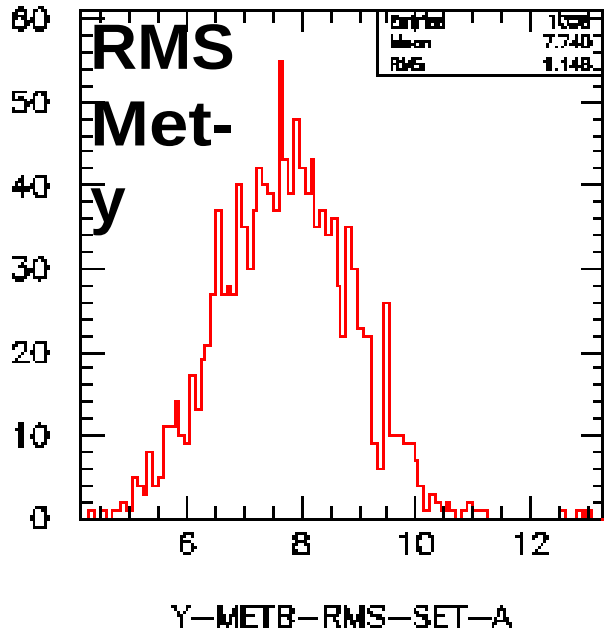
After run selection

One entry per run









Period A /Apr-02→Jul-02

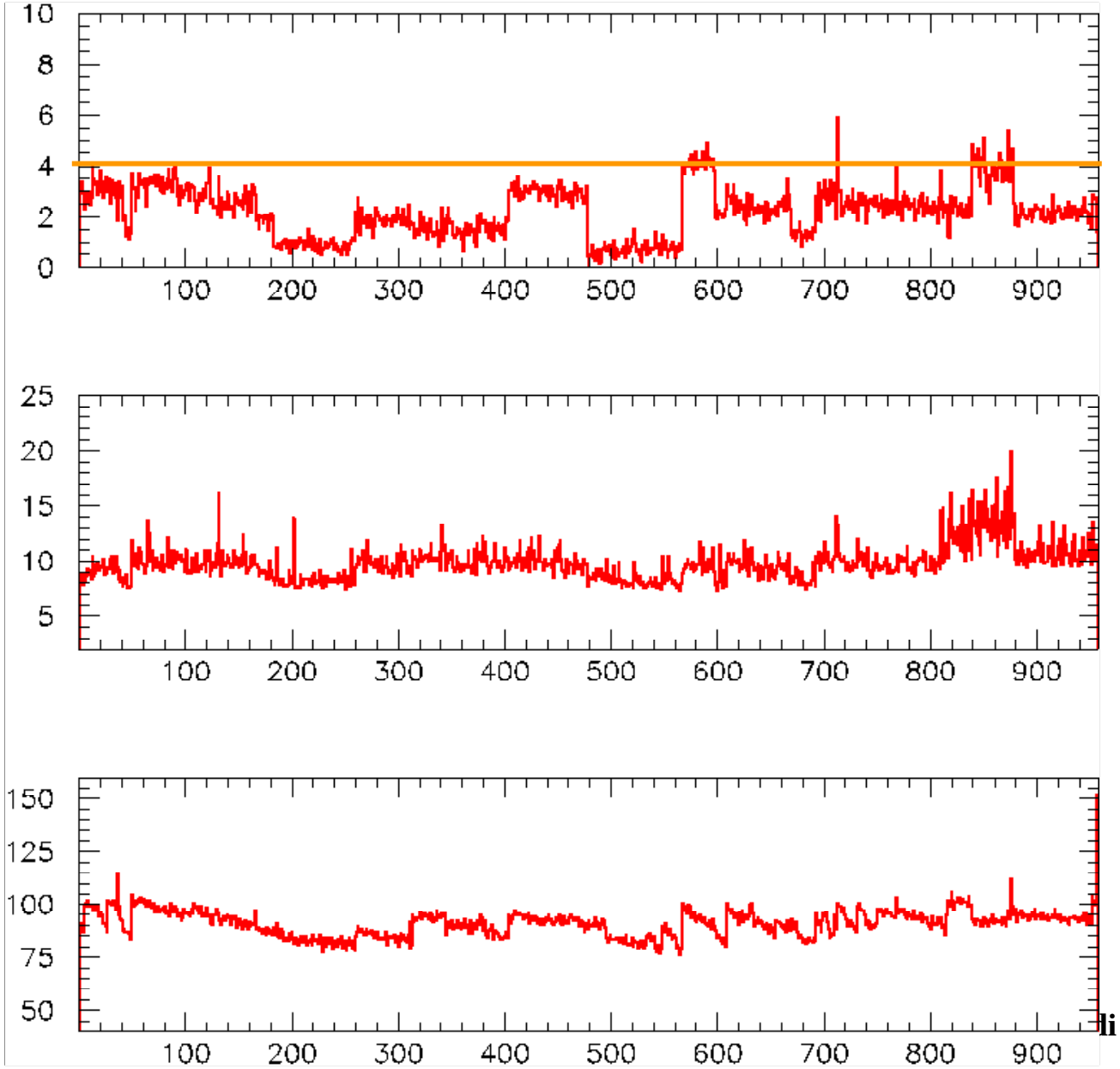
151817-157742

CFT complete

Stop at Calo mixing period

Trigger V5,7,8,9

4.1 % of Lumi LBN-rejected



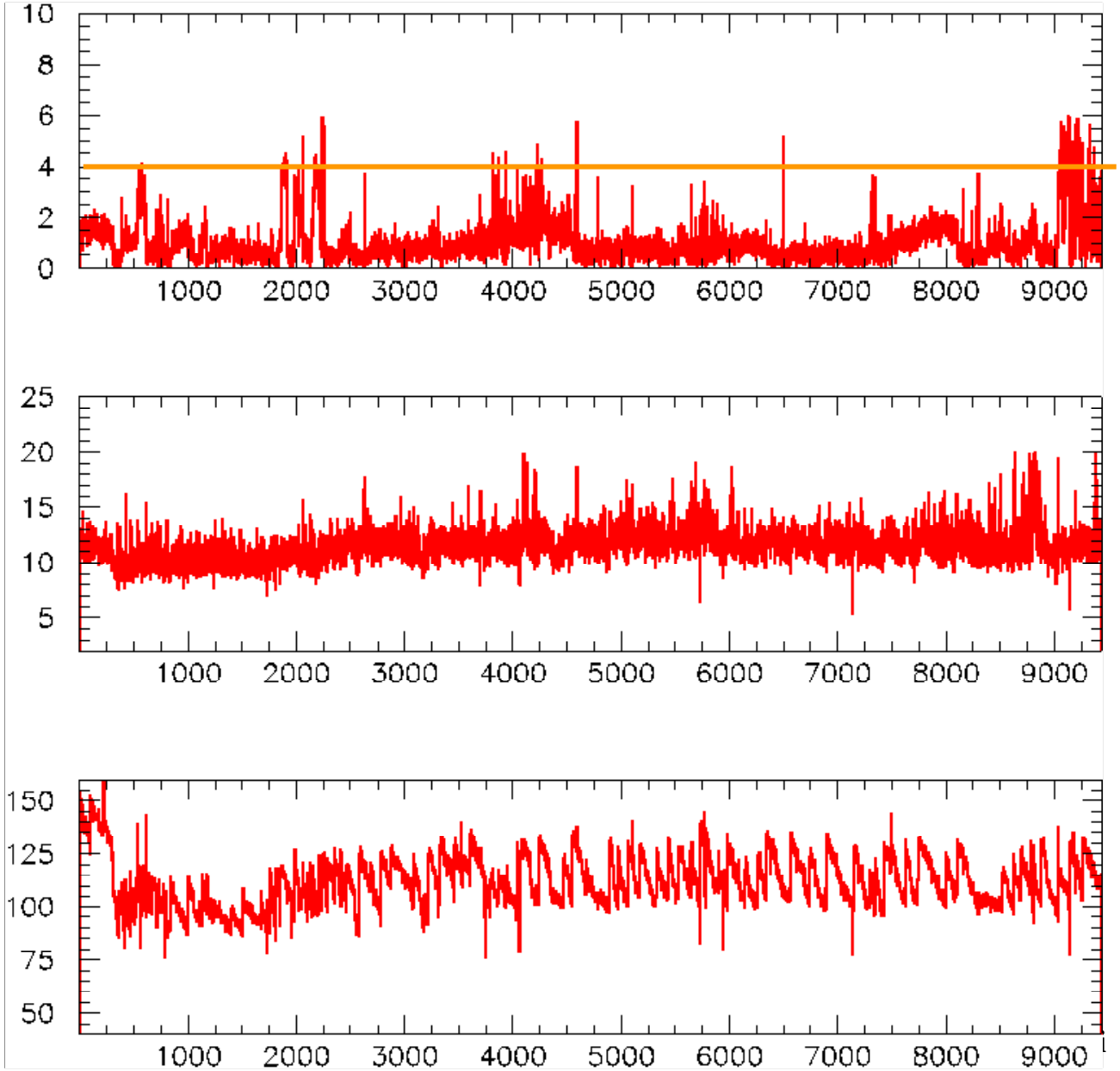
Period B /Aug-02→Jan-03

162004-170374

Stop at jan 2003 Shutdown

Trigger V8,9

3.5 % of Lumi LBN-rejected



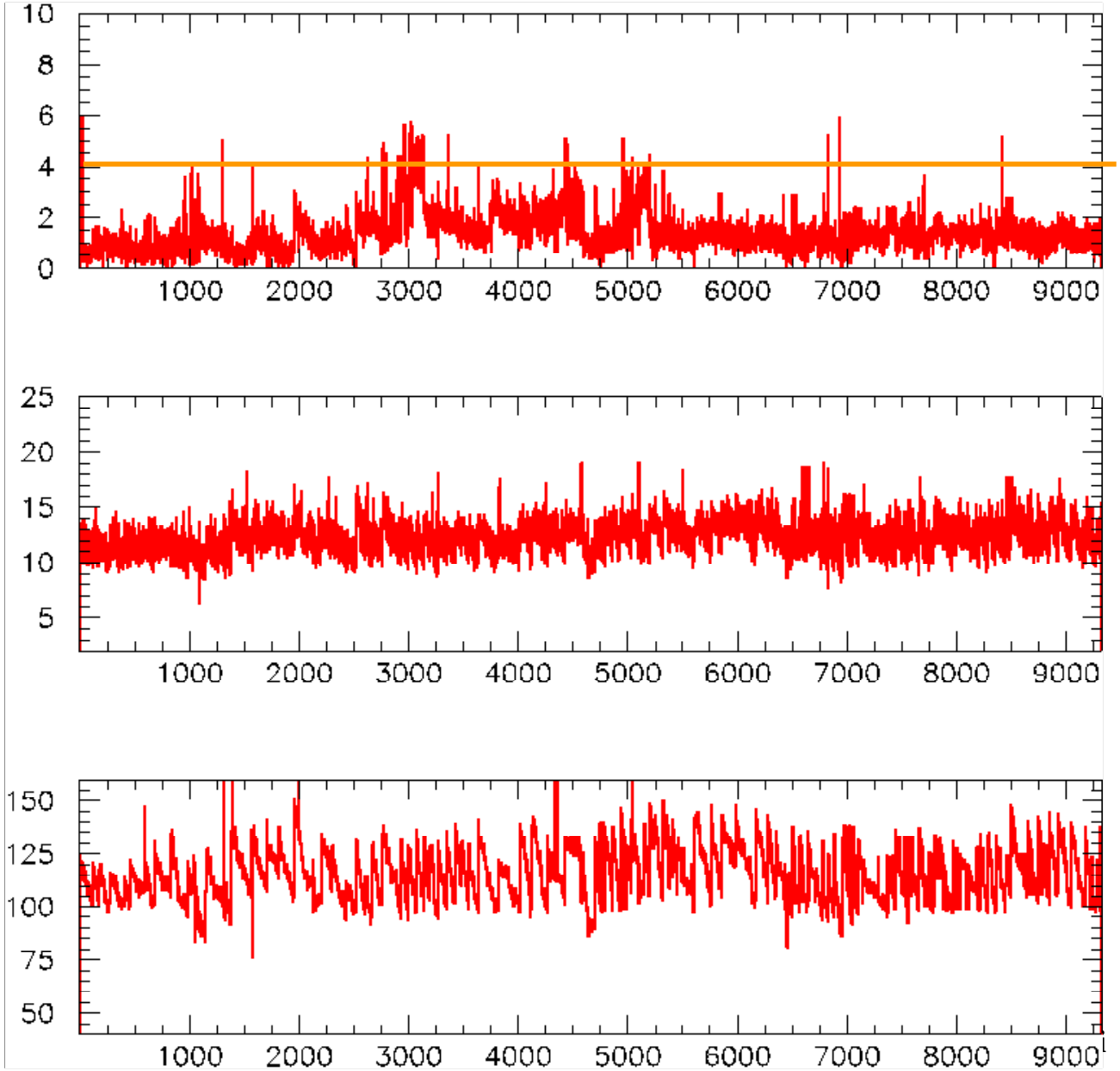
Period C /Feb-03→Jul-03

172399-178722

V10,11

Stop when going to V12.

3.4% of Lumi LBN-rejected



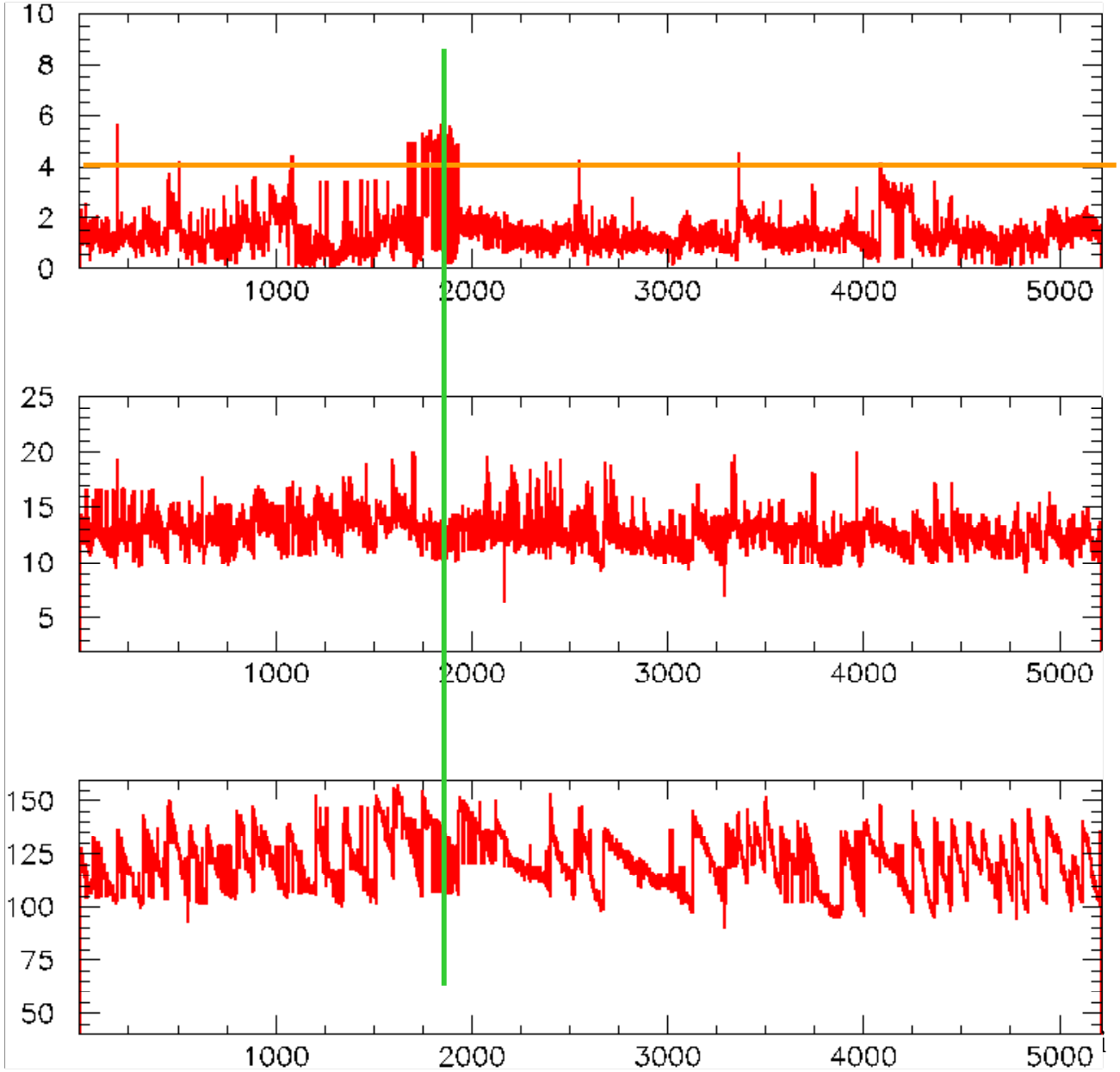
Period D Jul-03→Sep-03

178722-180956

V12

Stop at summer 03 Shutdown.

2.8 % of Lumi LBN-rejected



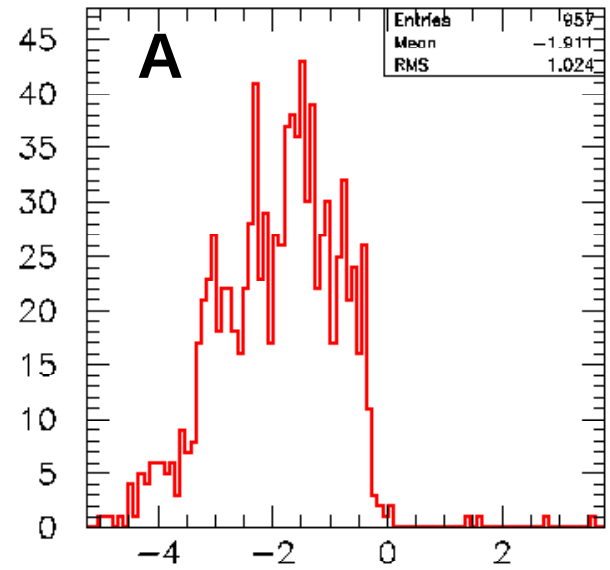
x-shift in Missing E_T, 4 periods

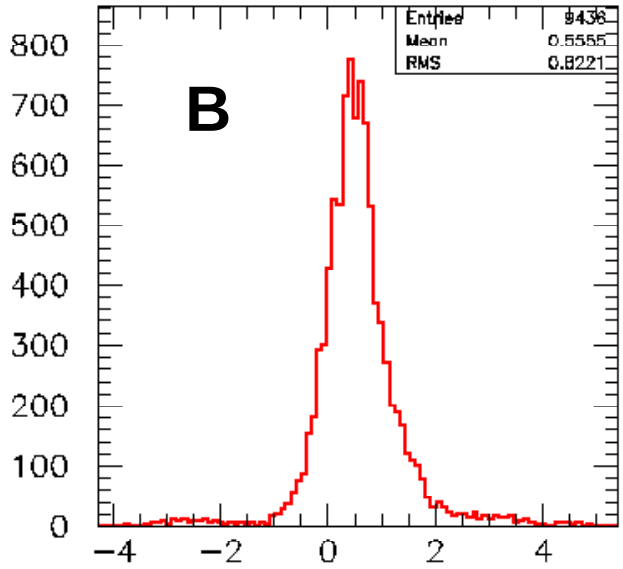
TMB fixed data (noT42)

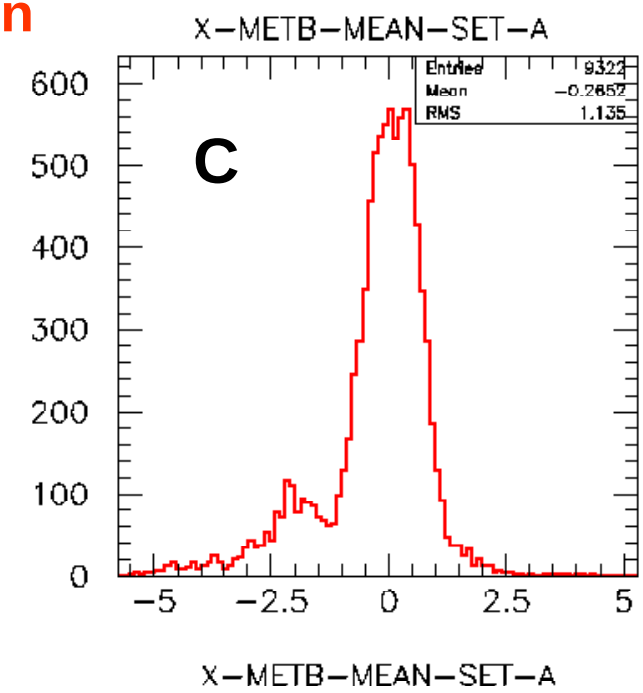
After LBN selection

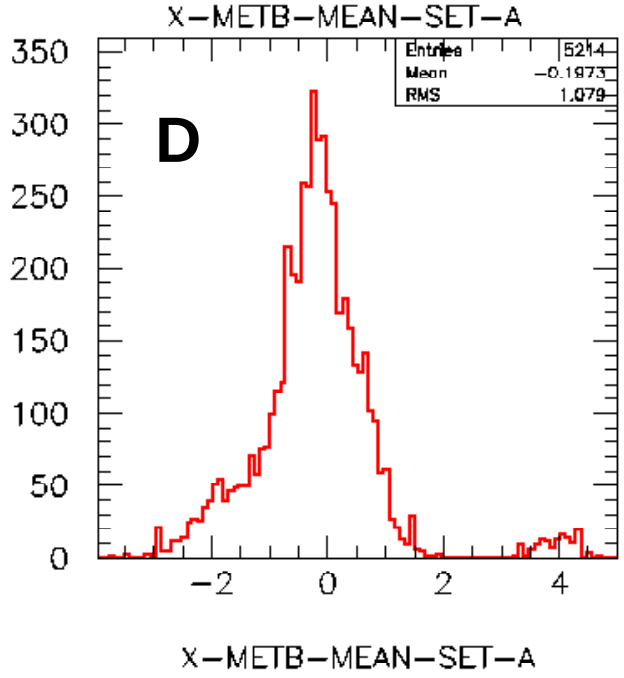
A,B are shifted

C,D are centered









y-shift in Missing E_T, 4 periods

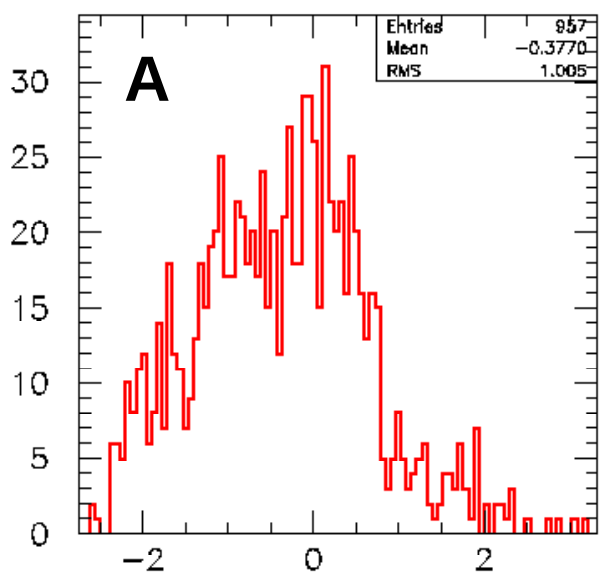
TMB fixed data (noT42)

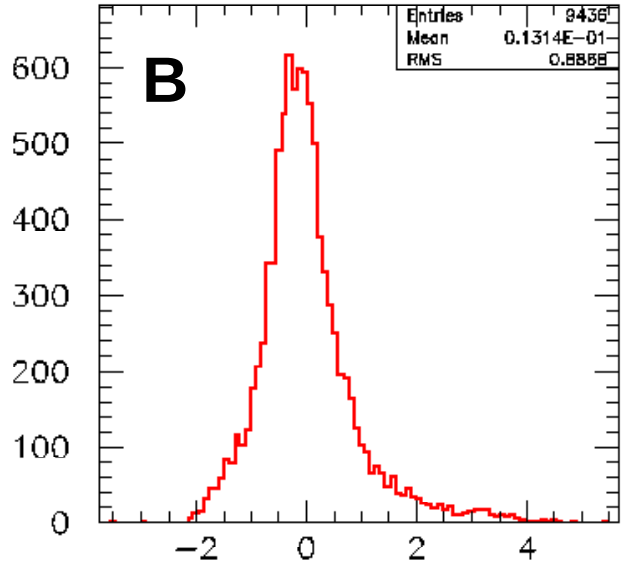
After LBN selection

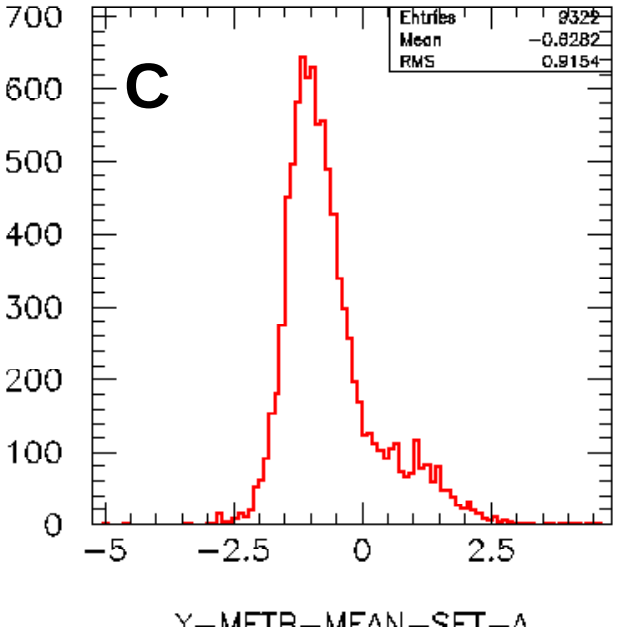
A,B are centered,

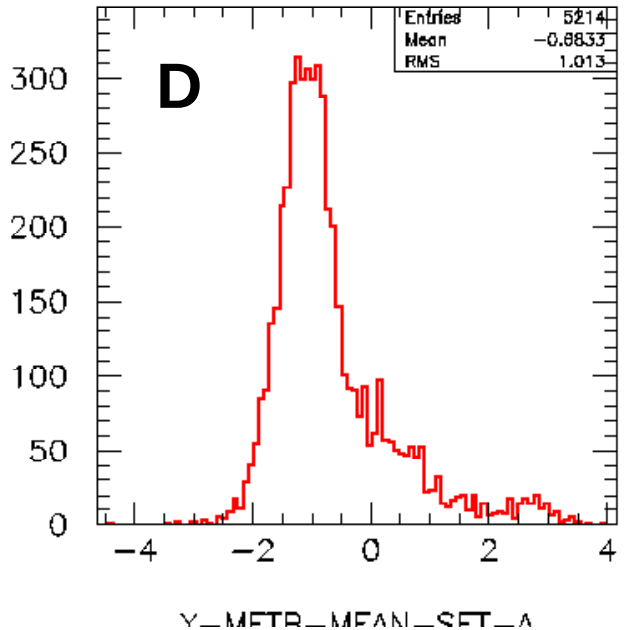
C,D are shifted by –0.85 GeV

Calo-Tracking Alignment ?





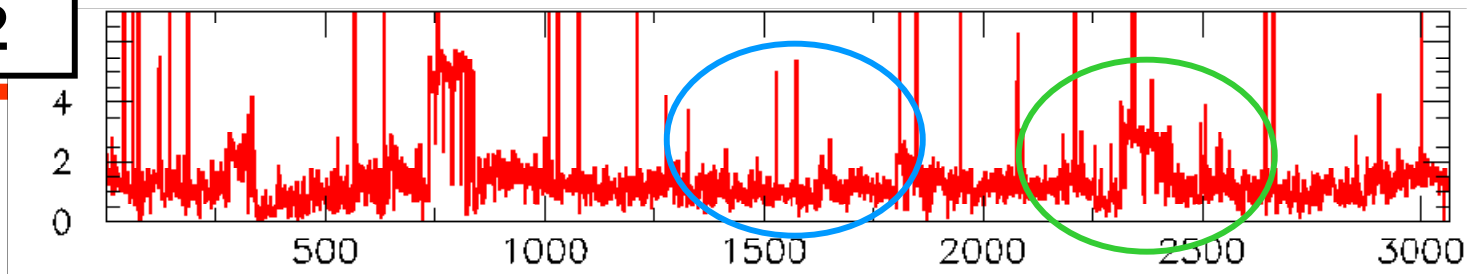




Effect of T42

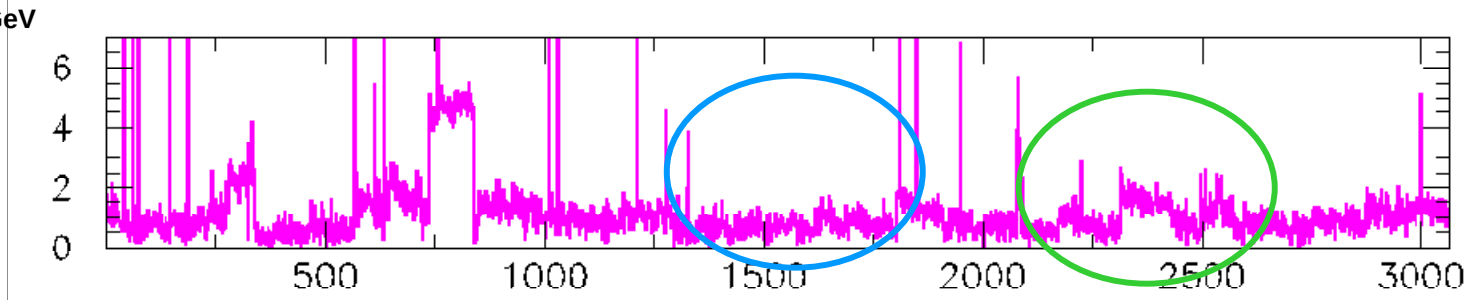
Met-xy Shift

P14.03.02



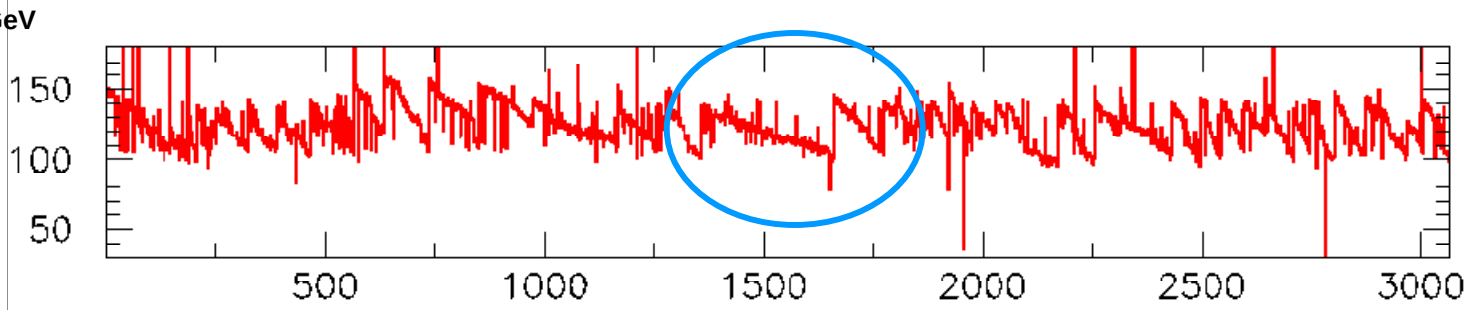
Met-xy Shift

With T42



Scalar E_T

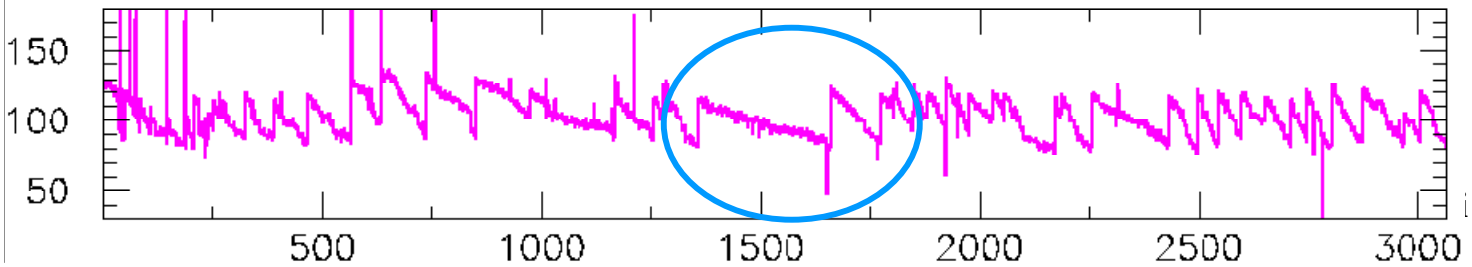
P14.03.02



T42 is "cleaner"

Scalar E_T

With T42



T42 vs no-T42

Data quality has improved after the Fix.
The standard JETMET runsel goes

from 85 to 86% (➔88% with T42).

On finer granularity (file/ LBN):

We reject 3.3% LBNs, 3.3% w/ o T42

Both T42 and no-T42 bad-JETMET LBN's lists are provided and allow to recover about 15pb^{-1} compared to run-based rejection

Prospects

Data quality on an average base is mature and shows that the bad calo data are at the 3% level. This can be further recovered by the next pass.

Next challenges:

- Continue to improve our understanding the quality at the event level (cf Slava and Patrice talks) → continue to fix hardware and data.

-Improve Calo-Tracking alignment

Access to the DB offers many more possibilities (thanks Ursula / DB team)

We need to fine tune the event/ event rejection.