SVT Upgrade Study

work in progress report

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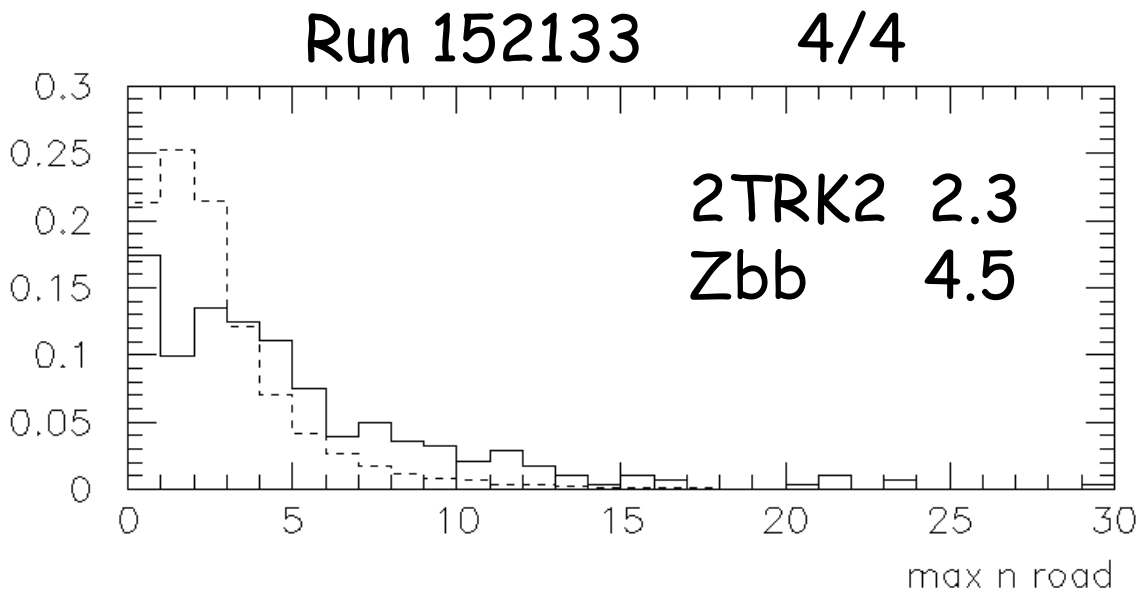
Outline:

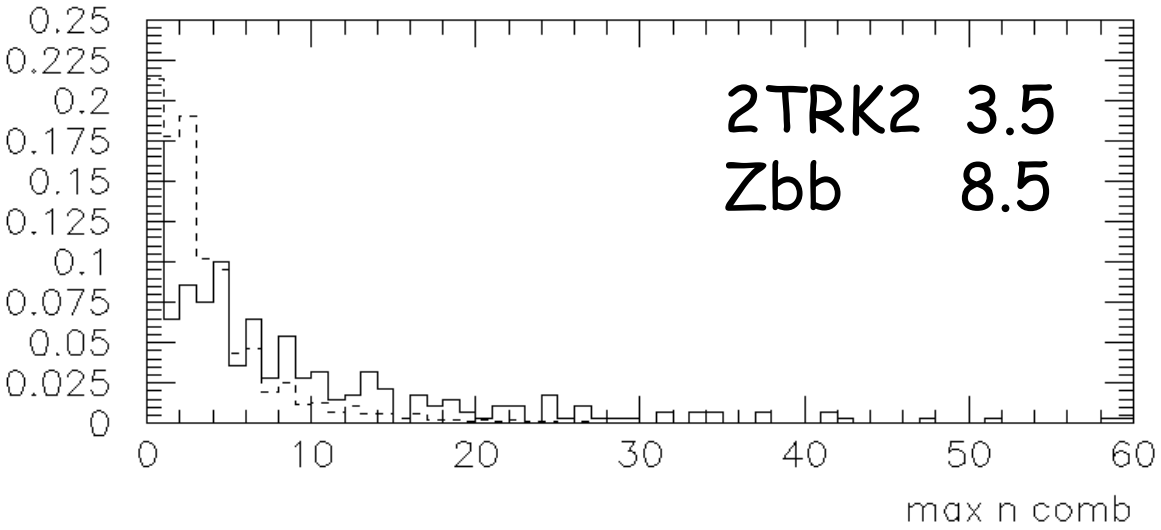
1. Compare TF workload for high-Pt and low-Pt L1 triggers.
2. Use 128k patterns to reduce SS size and TF workload

TF workload for different L1 triggers

—— L1_TWO_TRK2 (2TRK2)

- - - - - - L1_TWO_TRK2_&_TWO_CJET5 (Zbb)



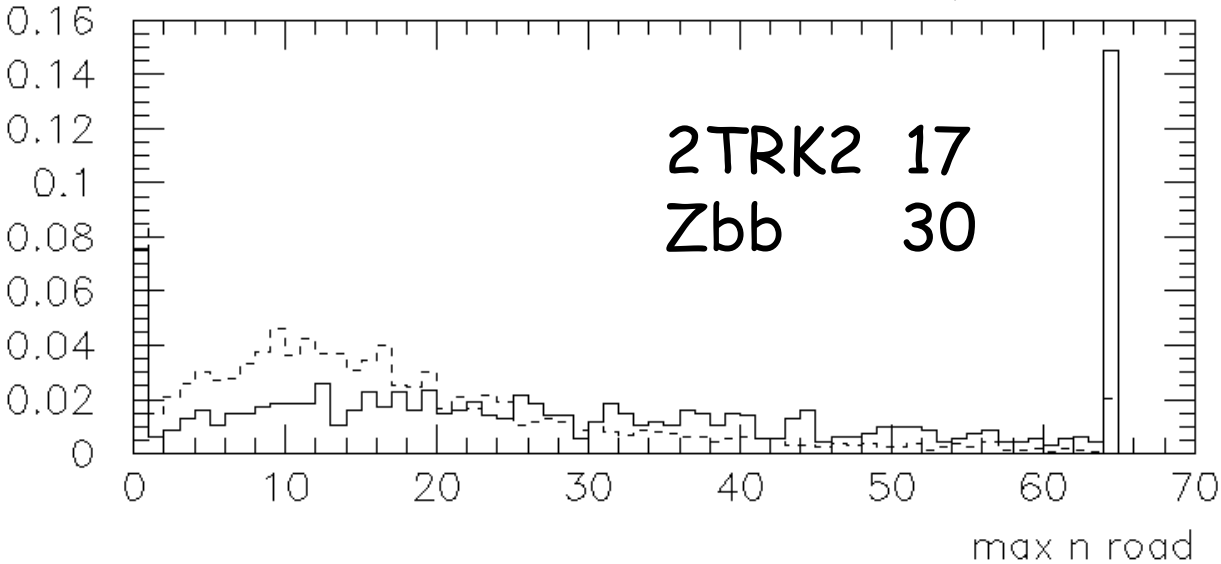


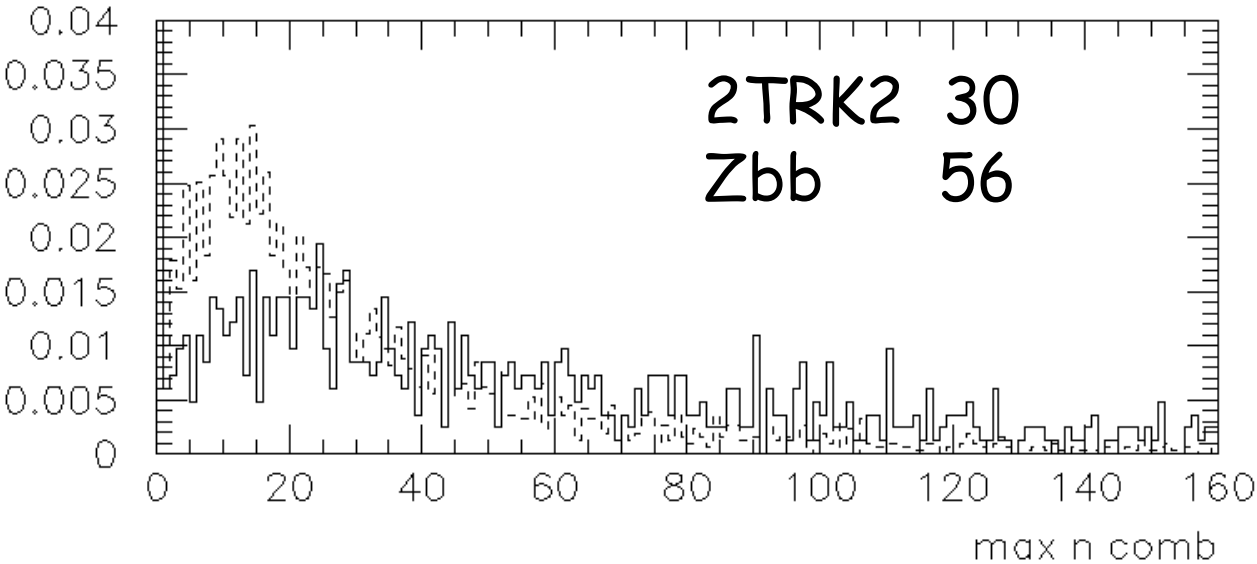
TF workload for different L1 triggers

—— L1_TWO_TRK2 (2TRK2)

-------- L1_TWO_TRK2_&_TWO_CJET5 (Zbb)

Run 156456 4/5

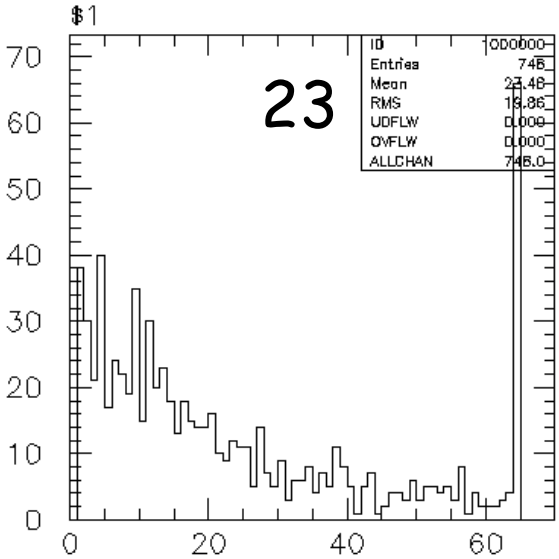




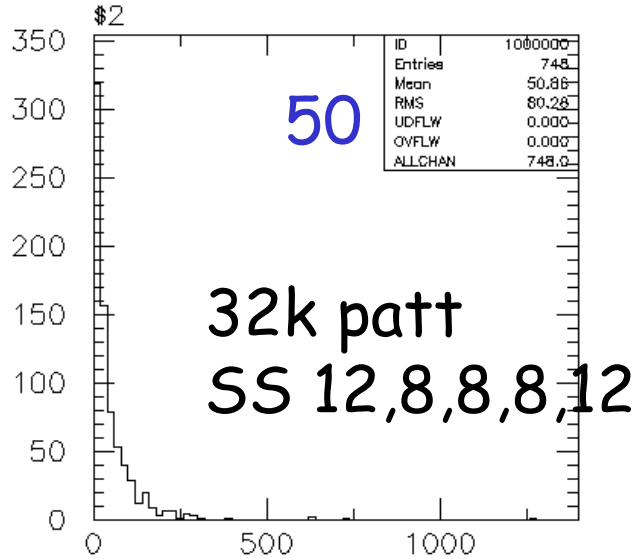
Increase # of patterns 32k -> 128k

- Use extra patterns to reduce SS size
- Still preliminary
  - One wedge only no max
  - Consider only events with roads to compensate for max over wedges
  - Run over Zbb trigger only
  - L1_TWO_TRK2 asap

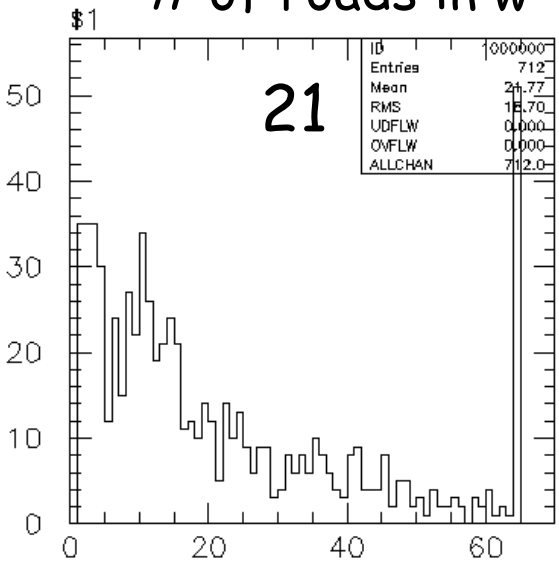
Compare 32k to 128k
Zbb sample, 4/5



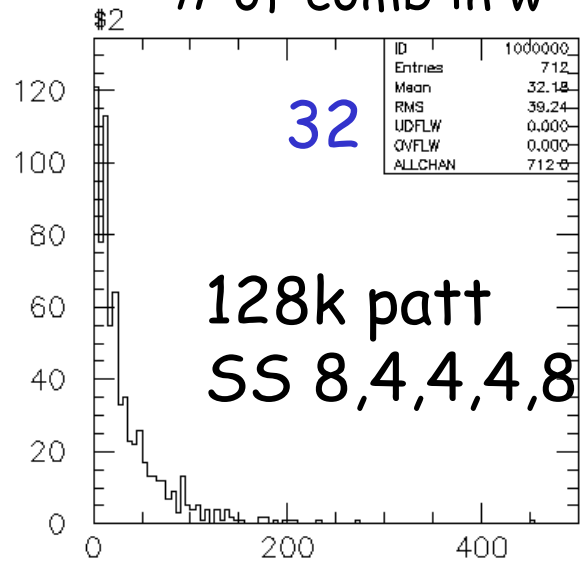
# of roads in w



# of comb in w

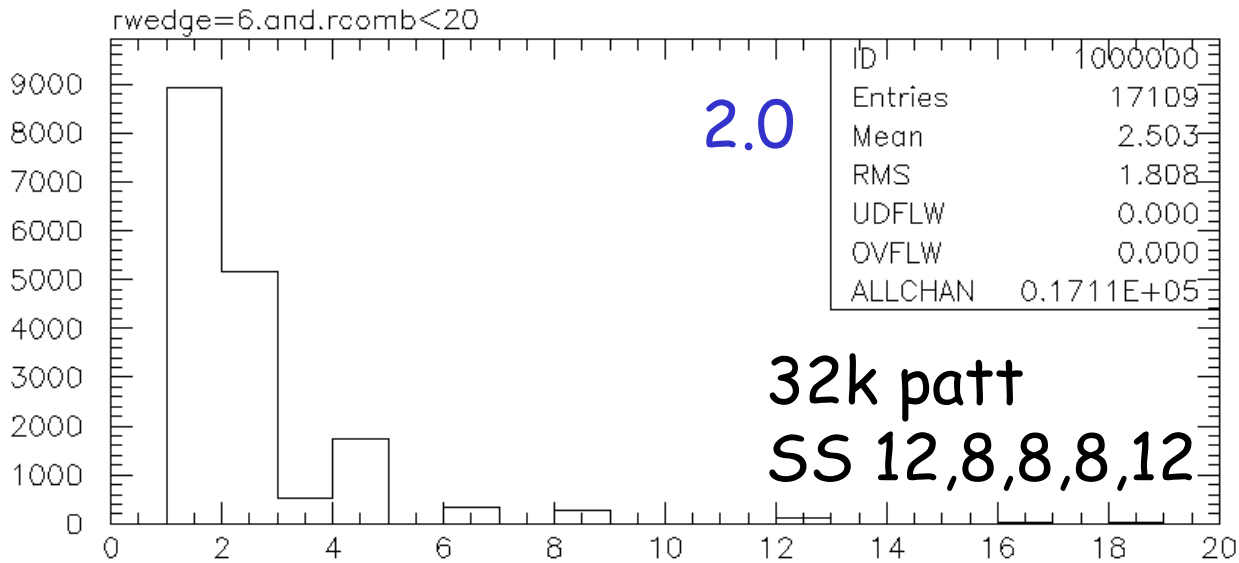


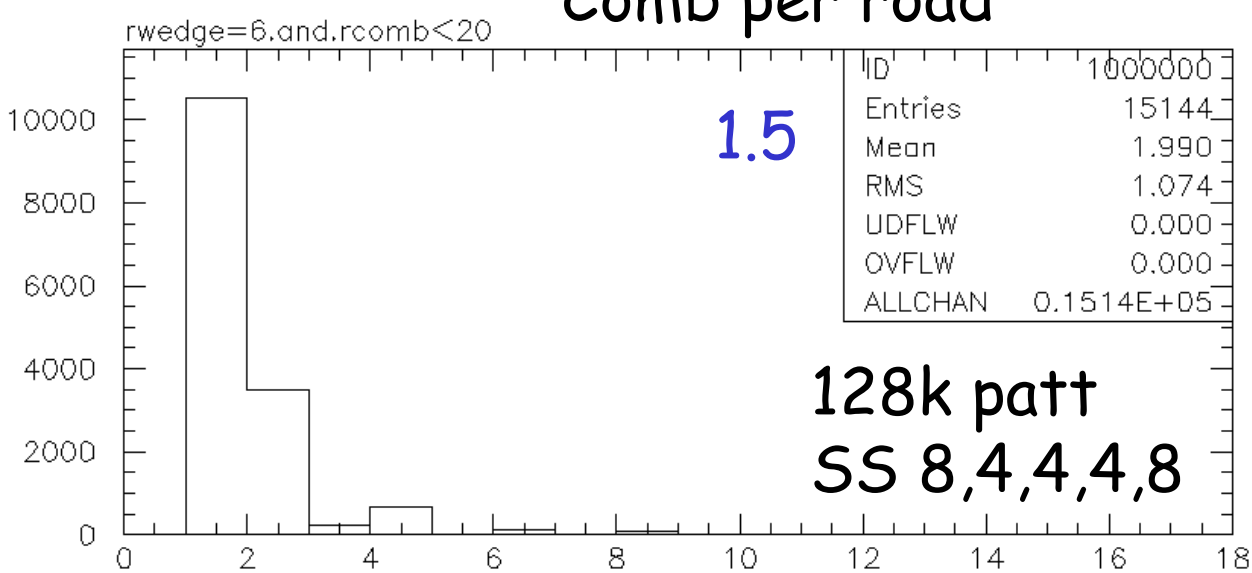
# of roads in w



# of comb in w

Compare 32k to 128k
Zbb sample, 4/5

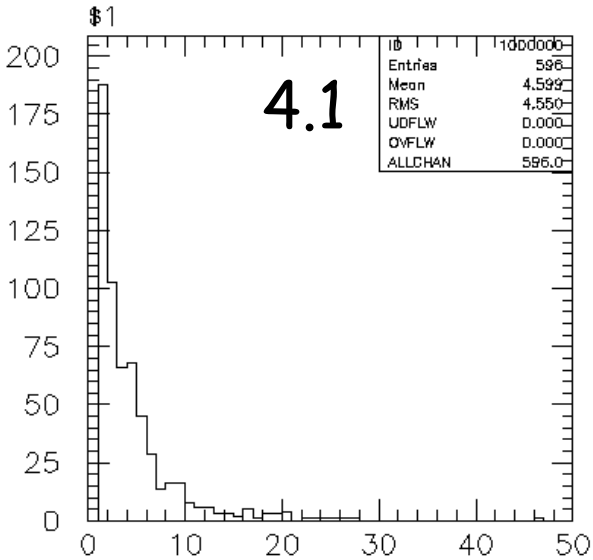




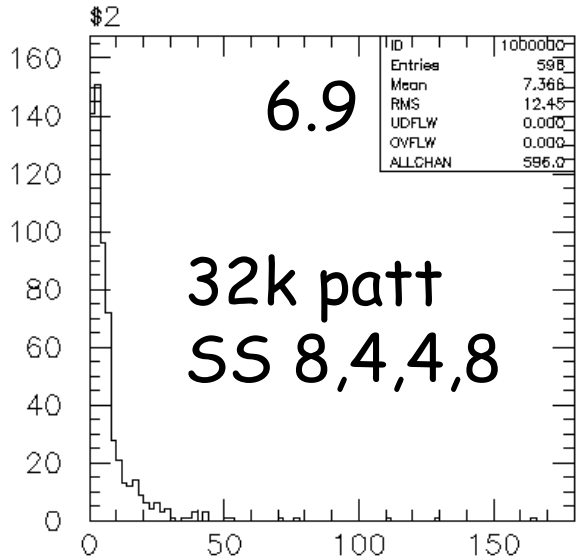
Can we afford 4/5?

- To reduce TF workload down to 4/4 case we need a factor of ~10
- 32k -> 128k patterns makes a factor of 2
- From a hw/sw ghost-buster before TF we expect a factor of ~5

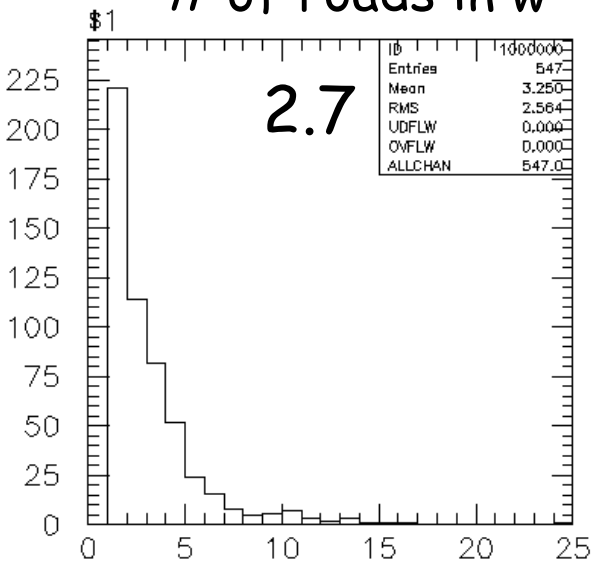
Compare 32k to 128k.
Zbb sample, 4/4



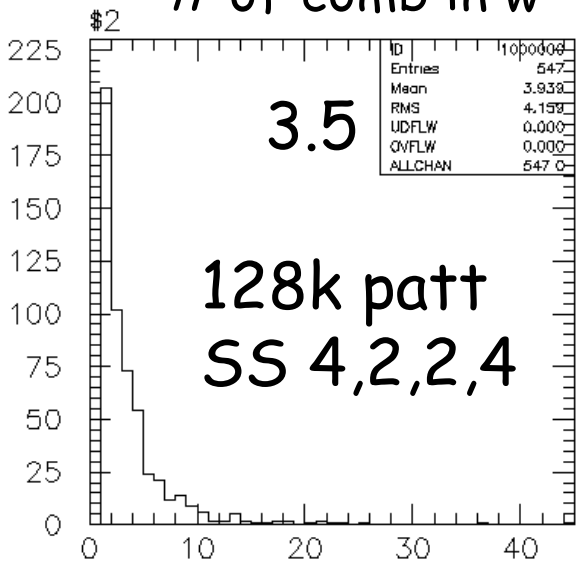
# of roads in w



# of comb in w



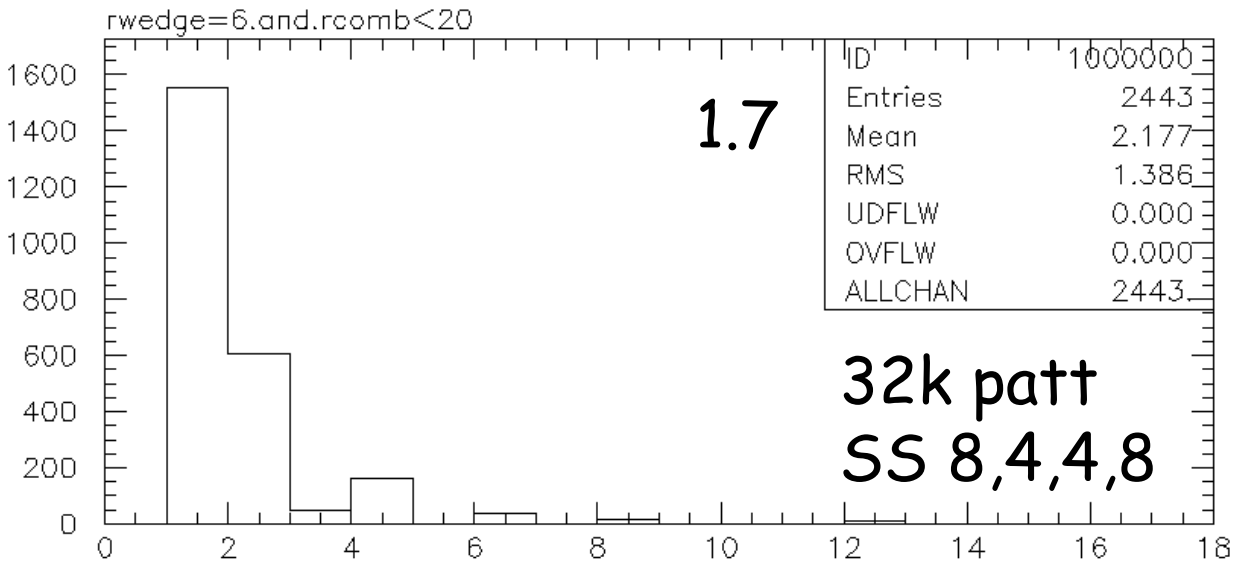
# of roads in w

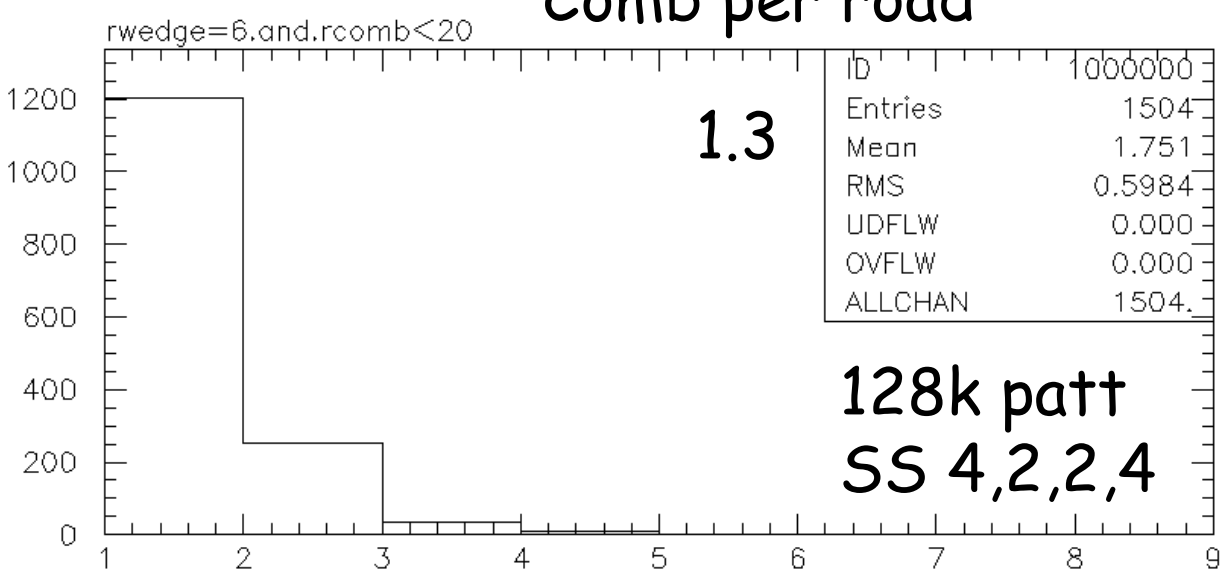


# of comb in w

SS 4,2,2,4 is slightly inefficient (3-4%)
-> increase SS a little bit

Compare 32k to 128k.
Zbb sample, 4/4





Other ideas

- Use part of the extra patterns for SVX only tracks:
  - High eta tracks
    (i.p. resolution ~88μm)
    guess 4/4 with ~30k patt

  - Primary vtx tracks for:
    high eta
    recover XFT inefficiency ?

  smaller luminosity region
  requires less patterns

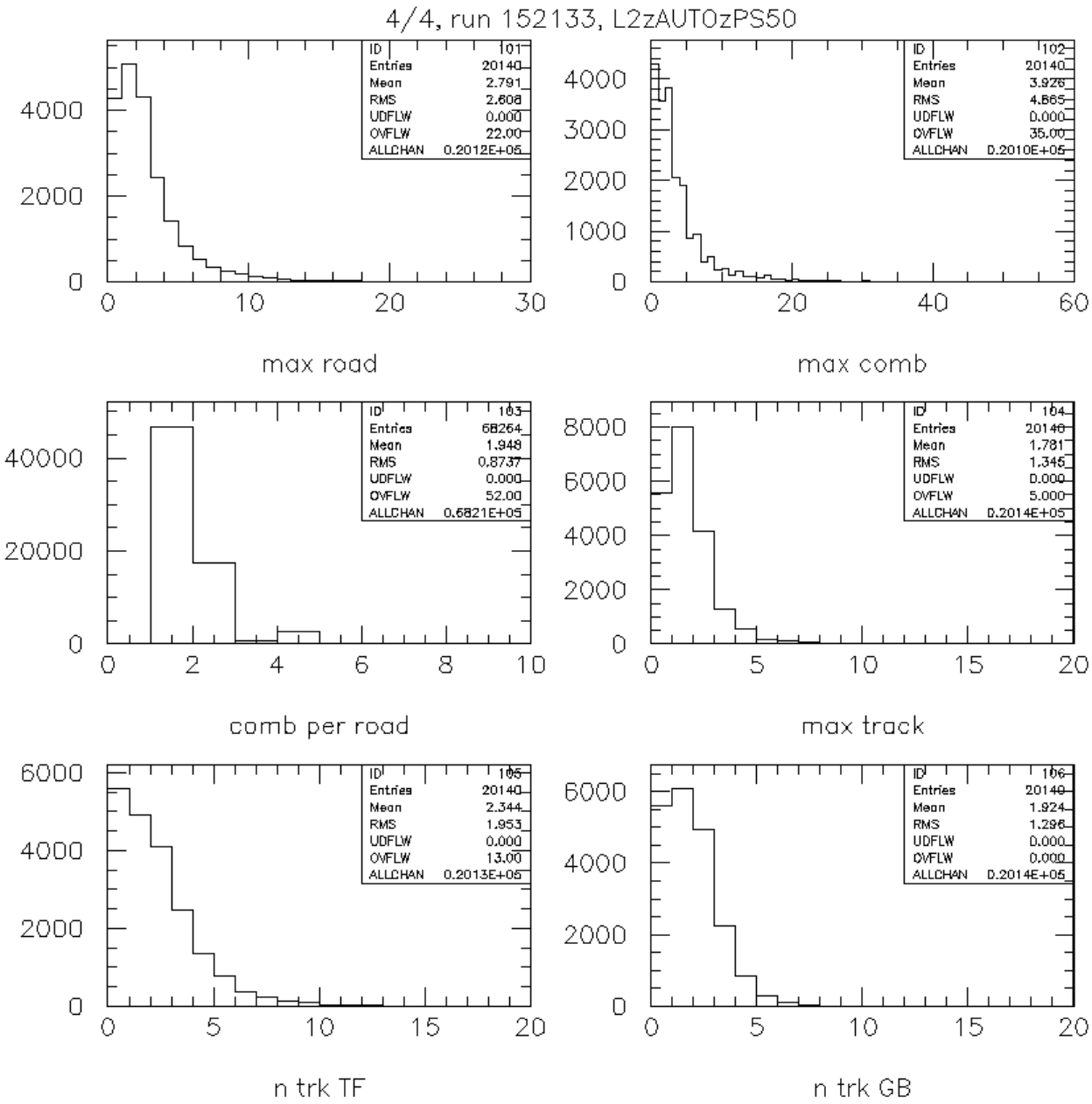
Conclusions

- Going from 2TRK2 to Zbb double TF workload
- 128k patterns reduce SS 4/5 from 12,8,8,8,12 to 8,4,4,4,8
  - Half combinations to fit
- We also need a hw/sw ghost-buster before TF for 4/5.
- We can use part of the patterns for SVX only tracks. More work is necessary.

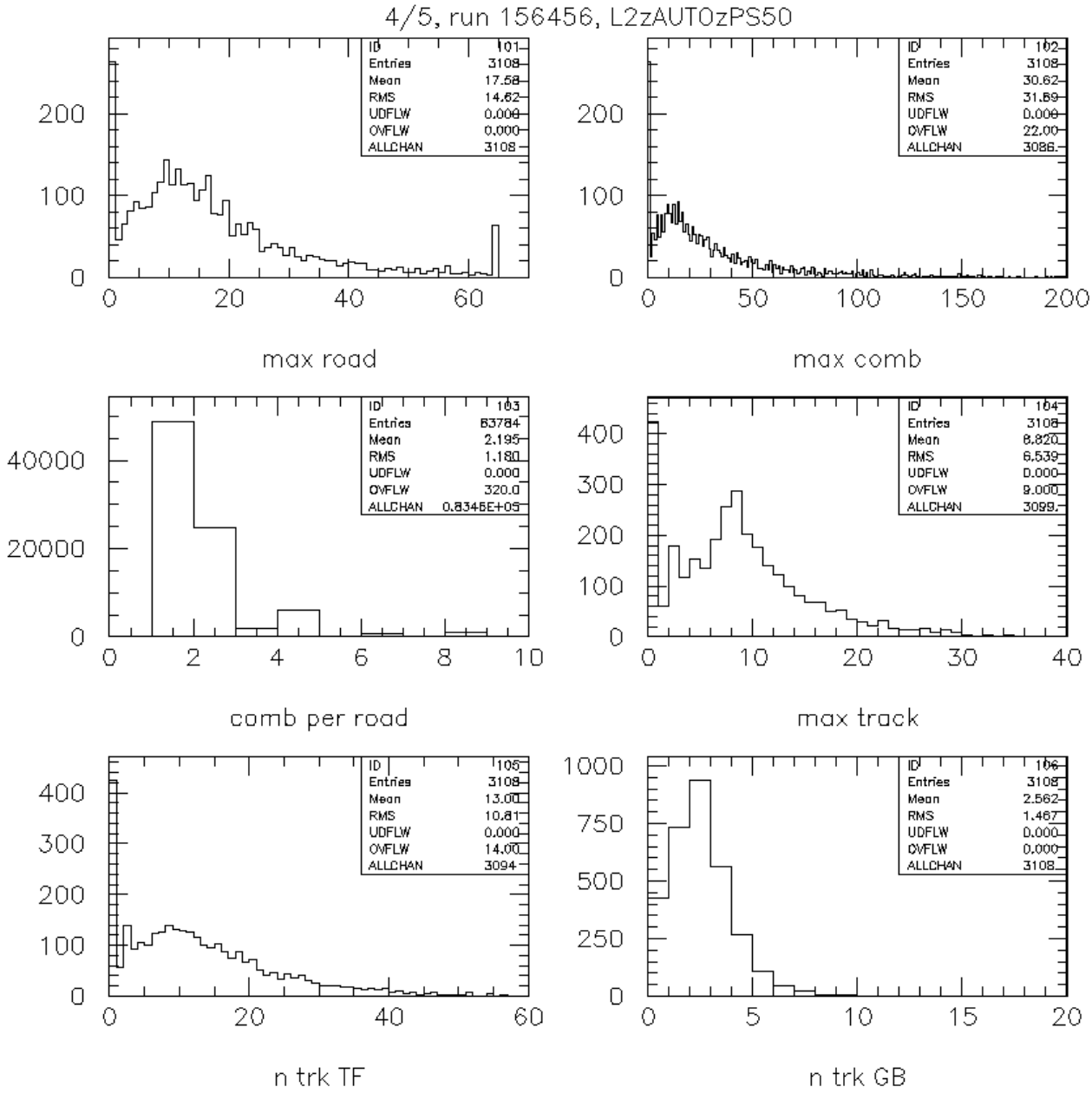
Other plots with more info

All plots are with 32k patterns and current SS size.

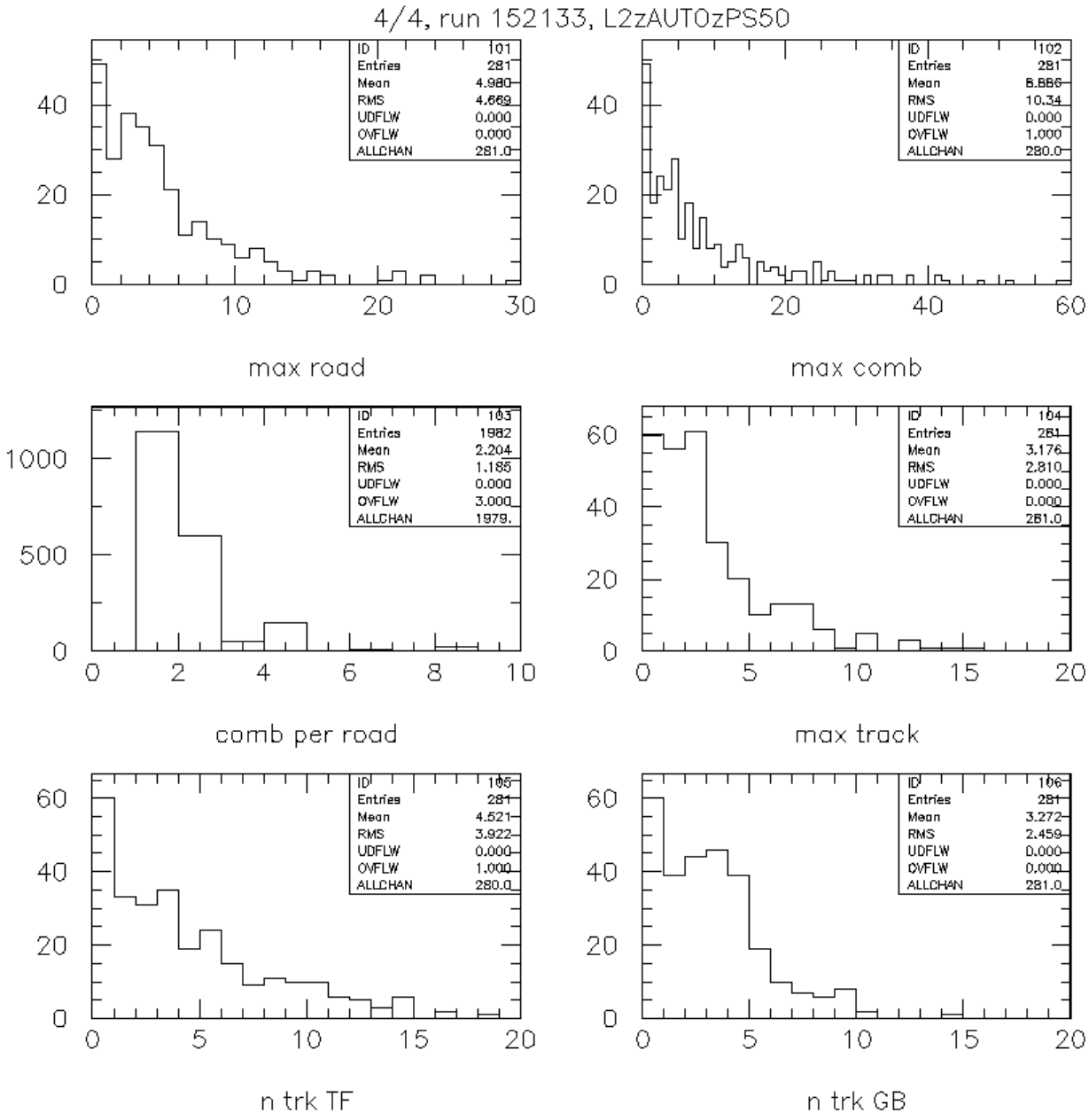
L1 2TRK2 4/4


4/4, run 152133, L2zAUTOzPS50
ID 101
Entries 20140
Mean 2.791
RMS 2.608
UDFLW 0.000
OVFLW 22.00
ALLCHAN 0.2012E+05
max road
ID 102
Entries 20140
Mean 3.926
RMS 4.865
UDFLW 0.000
OVFLW 35.00
ALLCHAN 0.2010E+05
max comb
ID 103
Entries 68264
Mean 1.948
RMS 0.8737
UDFLW 0.000
OVFLW 52.00
ALLCHAN 0.6821E+05
comb per road
ID 104
Entries 20146
Mean 1.781
RMS 1.345
UDFLW 0.000
OVFLW 5.000
ALLCHAN 0.2014E+05
max track
ID 105
Entries 20140
Mean 2.344
RMS 1.953
UDFLW 0.000
OVFLW 13.00
ALLCHAN 0.2013E+05
n trk TF
ID 106
Entries 20149
Mean 1.924
RMS 1.296
UDFLW 0.000
OVFLW 0.000
ALLCHAN 0.2014E+05
n trk GB

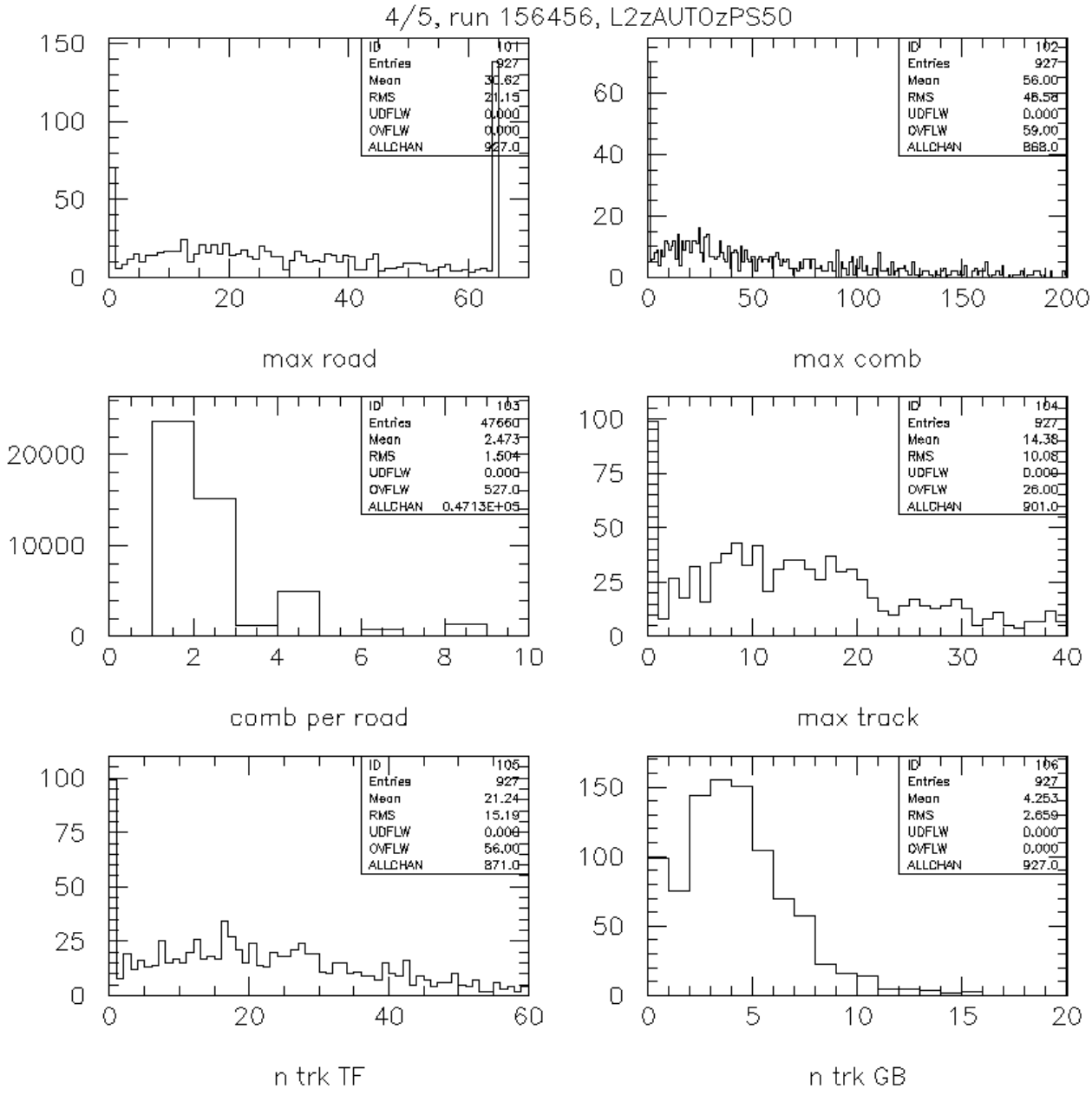
L1 2TRK2 4/5


4/5, run 156456, L2zAUTOzPS50
ID 101
Entries 3108
Mean 17.58
RMS 14.62
UDFLW 0.000
OVFLW 0.000
ALLCHAN 3108
max road
ID 102
Entries 3108
Mean 30.62
RMS 31.69
UDFLW 0.000
OVFLW 22.00
ALLCHAN 3086.
max comb
ID 103
Entries 63784
Mean 2.195
RMS 1.180
UDFLW 0.000
OVFLW 320.0
ALLCHAN 0.8346E+05
comb per road
ID 104
Entries 3108
Mean 8.820
RMS 6.539
UDFLW 0.000
OVFLW 9.000
ALLCHAN 3099.
max track
ID 105
Entries 3108
Mean 13.00
RMS 10.81
UDFLW 0.000
OVFLW 14.00
ALLCHAN 3094
n trk TF
ID 106
Entries 3108
Mean 2.562
RMS 1.467
UDFLW 0.000
OVFLW 0.000
ALLCHAN 3108.
n trk GB

L1 Zbb 4/4


4/4, run 152133, L2zAUTOzPS50
ID 101
Entries 281
Mean 4.980
RMS 4.669
UDFLW 0.000
OVFLW 0.000
ALLCHAN 281.0
max road
ID 102
Entries 281
Mean 8.886
RMS 10.34
UDFLW 0.000
OVFLW 1.000
ALLCHAN 280.0
max comb
ID 103
Entries 1982
Mean 2.204
RMS 1.185
UDFLW 0.000
OVFLW 3.000
ALLCHAN 1979.
comb per road
ID 104
Entries 281
Mean 3.176
RMS 2.810
UDFLW 0.000
OVFLW 0.000
ALLCHAN 281.0
max track
ID 105
Entries 281
Mean 4.521
RMS 3.922
UDFLW 0.000
OVFLW 1.000
ALLCHAN 280.0
n trk TF
ID 106
Entries 281
Mean 3.272
RMS 2.459
UDFLW 0.000
OVFLW 0.000
ALLCHAN 281.0
n trk GB

L1 Zbb 4/5


4/5, run 156456, L2zAUTOzPS50
ID 101
Entries 927
Mean 30.62
RMS 21.15
UDFLW 0.000
OVFLW 0.000
ALLCHAN 927.0
max road
ID 102
Entries 927
Mean 56.00
RMS 46.58
UDFLW 0.000
OVFLW 59.00
ALLCHAN 868.0
max comb
ID 103
Entries 47660
Mean 2.473
RMS 1.504
UDFLW 0.000
OVFLW 527.0
ALLCHAN 0.4713E+05
comb per road
ID 104
Entries 927
Mean 14.38
RMS 10.08
UDFLW 0.000
OVFLW 26.00
ALLCHAN 901.0
max track
ID 105
Entries 927
Mean 21.24
RMS 15.19
UDFLW 0.000
OVFLW 56.00
ALLCHAN 871.0
n trk TF
ID 106
Entries 927
Mean 4.253
RMS 2.659
UDFLW 0.000
OVFLW 0.000
ALLCHAN 927.0
n trk GB