

# First results: $\frac{1}{2}$ -SS shifted bank

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# $\frac{1}{2}$ SS-shifted banks

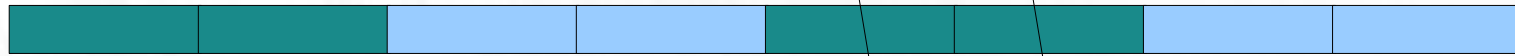
SS1=

0

1

2

3



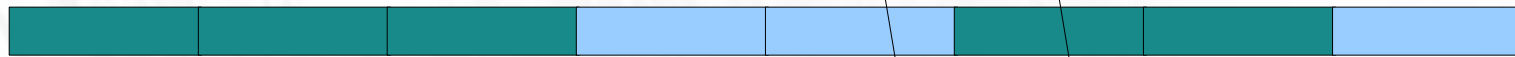
SS2=

0

1

2

3



- Top = default bank
- Bottom =  $\frac{1}{2}$  SS-shifted bank
- First SS is extra long (to handle edge effect)
- Road condition: **SS1 = SS2 + 1**
- Can only do fits found in both SS1 and SS2

# Advantages

- By having two banks, we double patt size
- But, by resolving  $\frac{1}{2}$  SS width,  $\epsilon^{11}$  less fits
- Two ways to study this effect:
  - Compare 50x64 -vs- 100x128 with two banks
    - Expect nearly identical efficiency & fewer fits
    - Running now –results **next week**
  - Compare 50x64 -vs- 50x64 with two banks
    - Expect slightly reduced efficiency
    - A lot fewer fits
    - Results **in this talk**

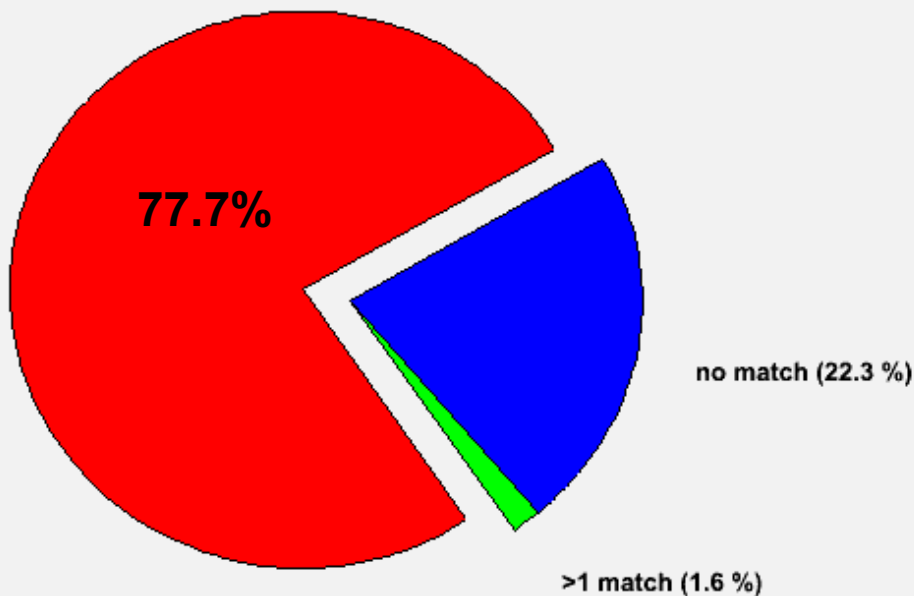
# 50x64 -vs- 50x64 with two banks

- Comparison is on  $10^{34}$  Whbb events with:
- **[DONE]** Sector requirement on roads:
  - For every road in default bank, require a road in  $\frac{1}{2}$  shifted bank with the same sector
- **[DONE]** Superstrip requirement on roads:
  - Only accept roads also found in shifted bank
- **[IN PROGRESS]** Partial fits
  - Only use hits found in both superstrips
  - Potentially great reduction in # fits

# Efficiency (w.r.t IPAT)

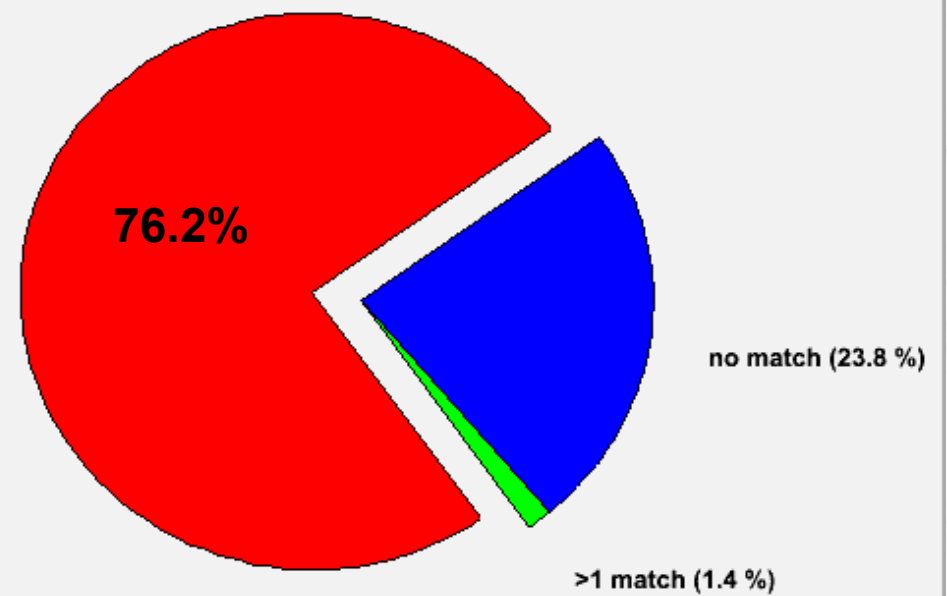
Default bank

Ipat tracks matched to ftk



Default bank + road filtering via shifted bank

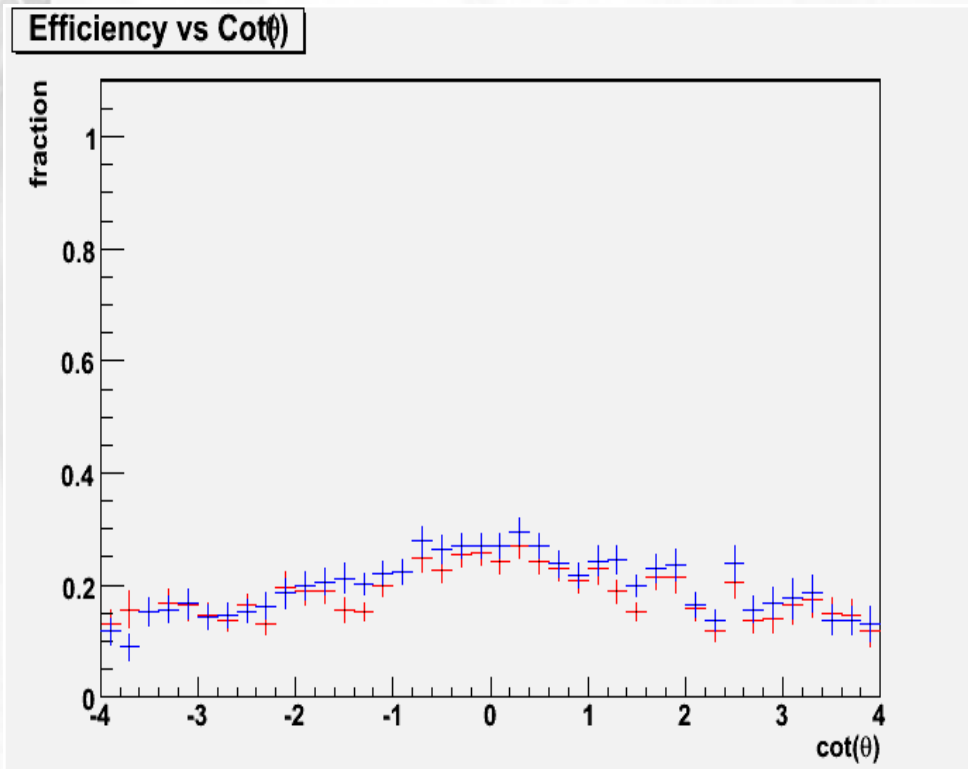
Ipat tracks matched to ftk



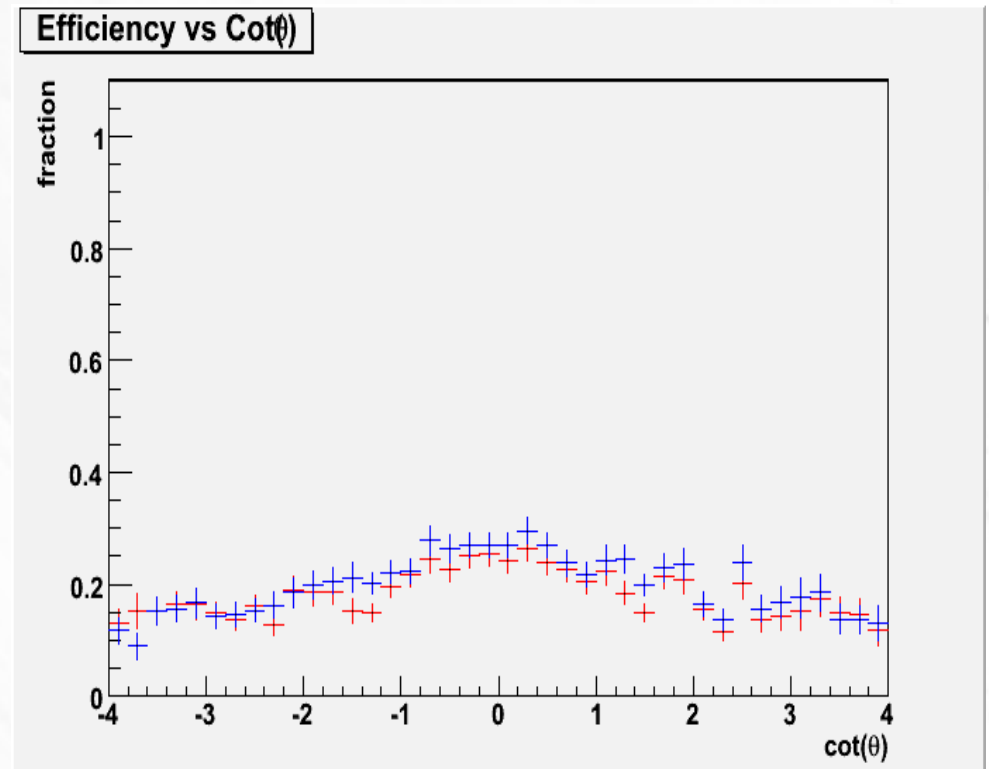
The right plot is guaranteed to have lower efficiency, since it applies additional requirements on accepted roads

# Efficiency (w.r.t 'truth')

Default bank



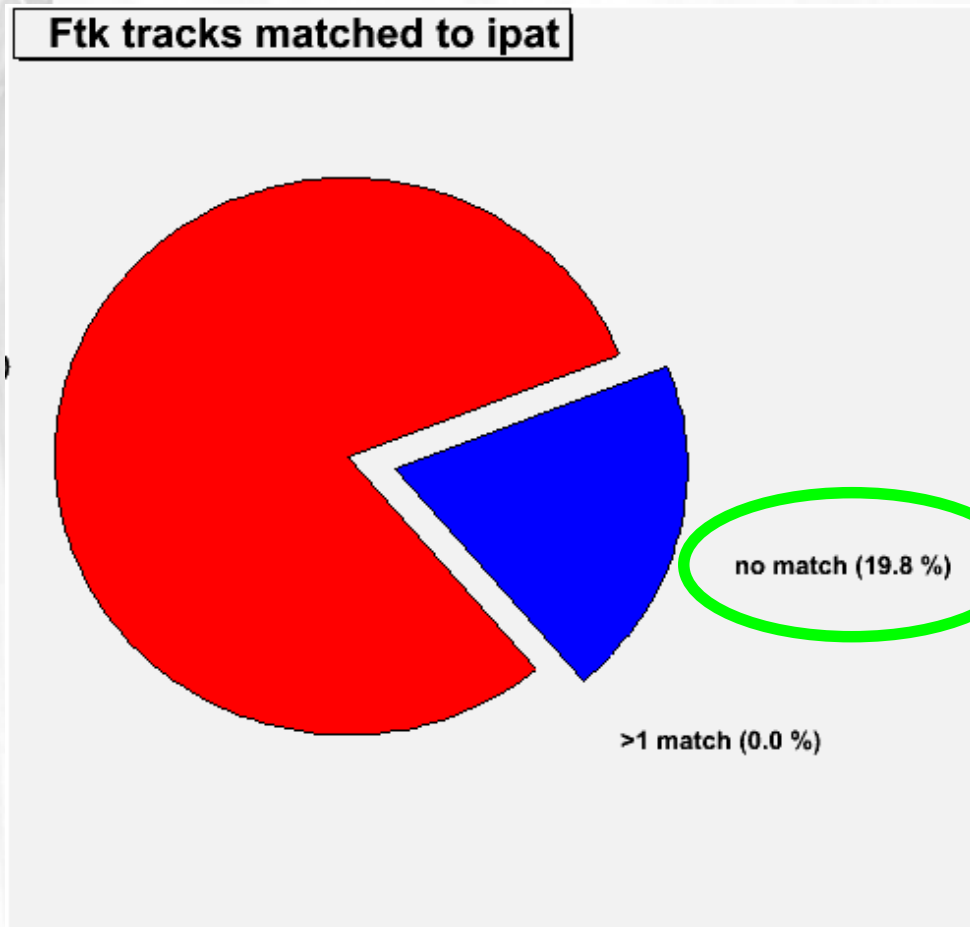
Default bank + road filtering via shifted bank



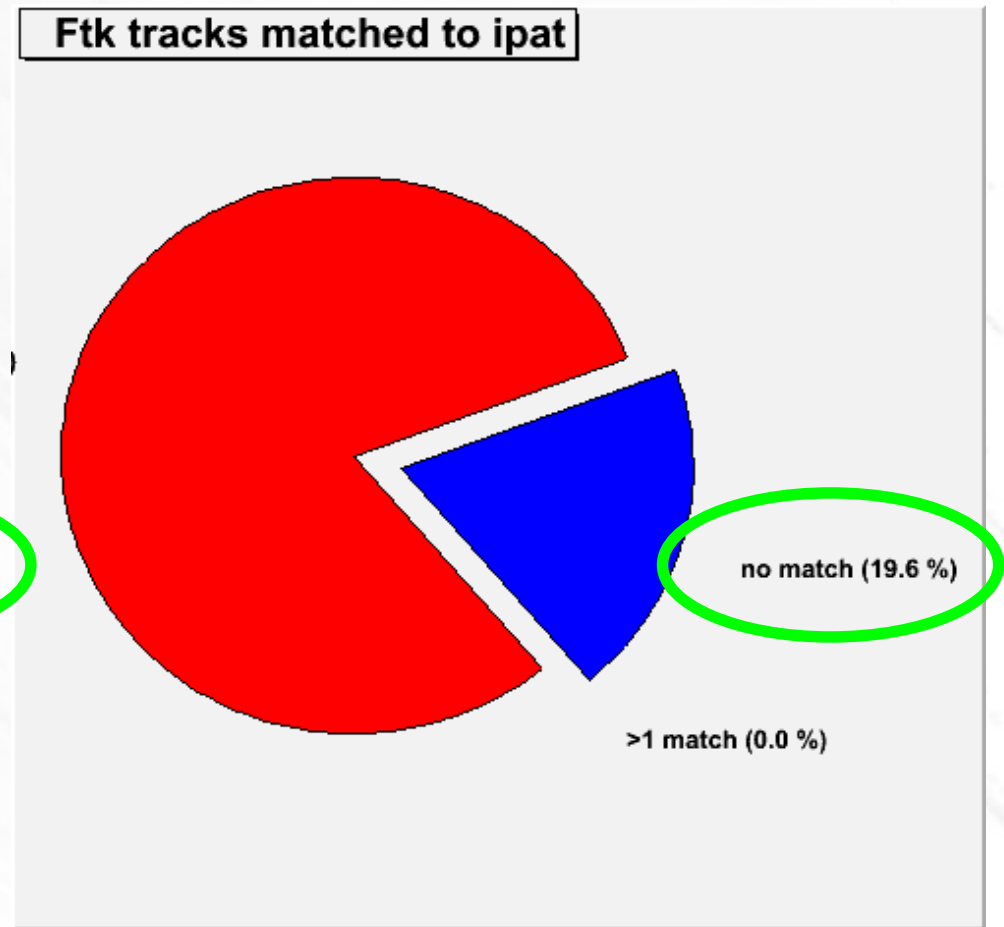
Note that truth matching problem is yet unresolved.  
So, on the absolute scale, both efficiencies are low.  
But, they are extremely similar!

# Fakes (w.r.t IPAT)

Default bank



Default bank + road filtering via shifted bank



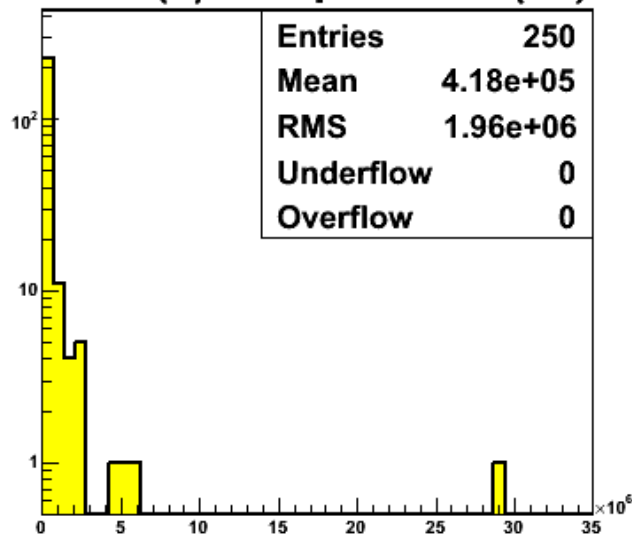
Slightly lower # of fakes: the roads that we dropped were “bad” roads to begin with

# # fits per event per crate

Default bank

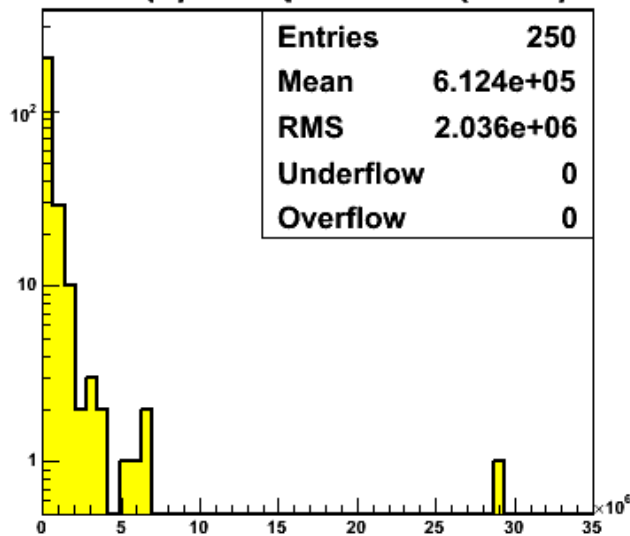
11/11 fits

ALL(1): fits per event(all)



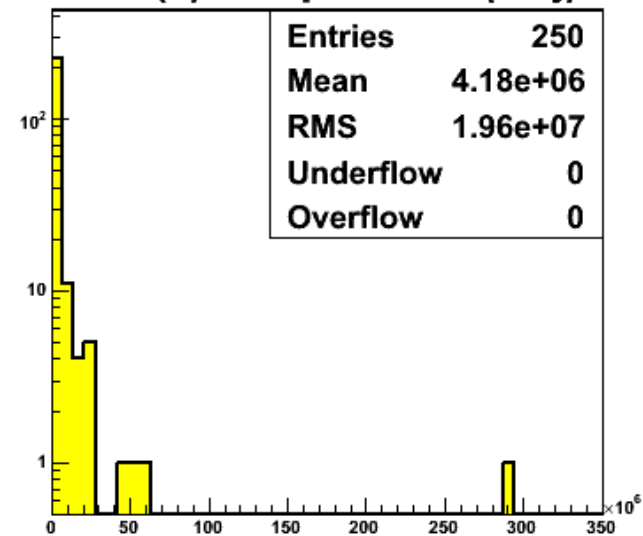
10/11 fits

ALL(1): fits per event(miss)



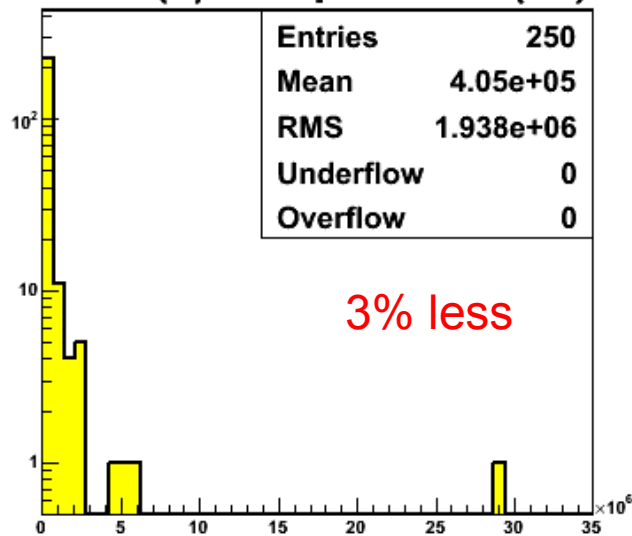
10/11 majority-recovered fits

ALL(1): fits per event(maj)

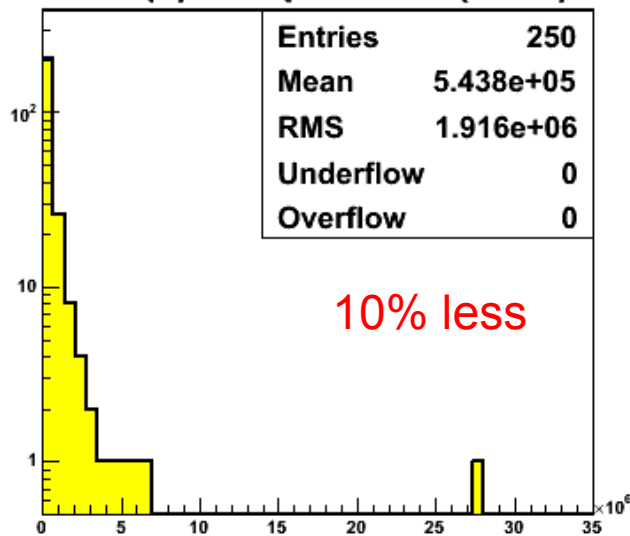


Default bank + road filtering via shifted bank (sector cut only)

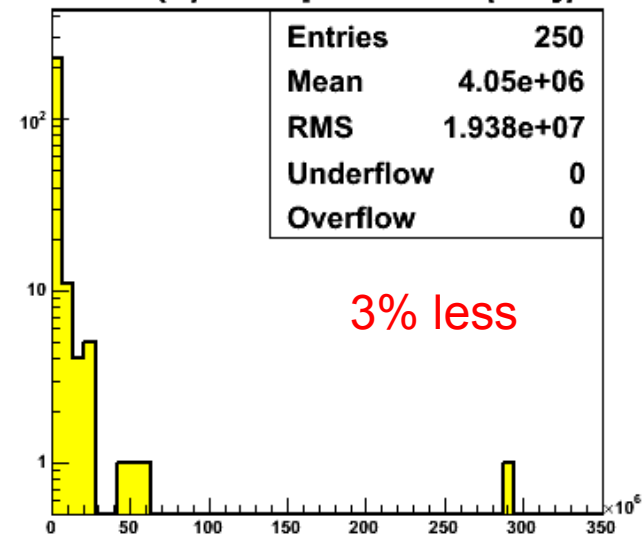
ALL(1): fits per event(all)



ALL(1): fits per event(miss)



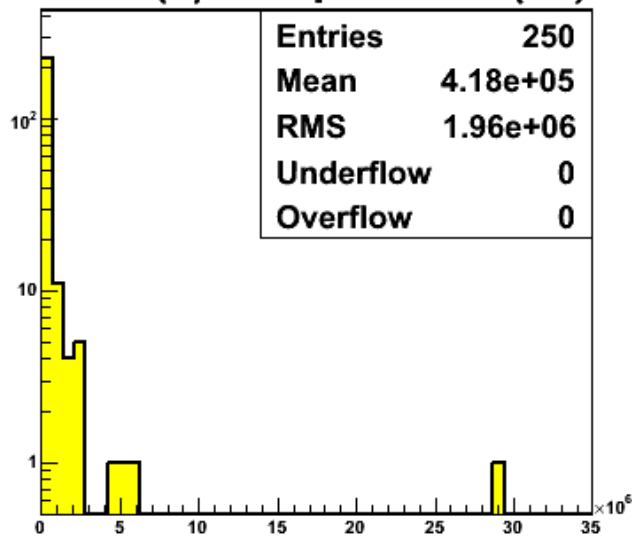
ALL(1): fits per event(maj)



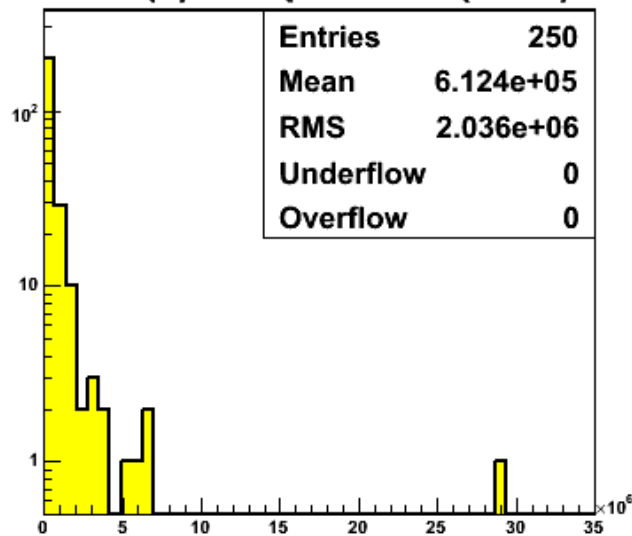
# # fits per event per crate

## Default bank

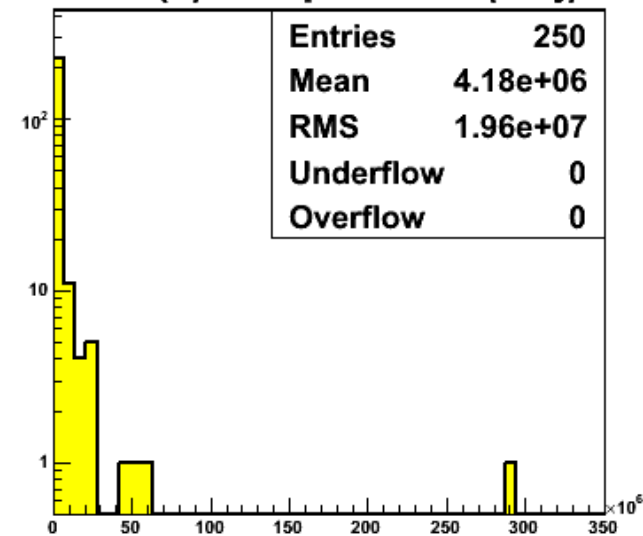
### ALL(1): fits per event(all)



### ALL(1): fits per event(miss)

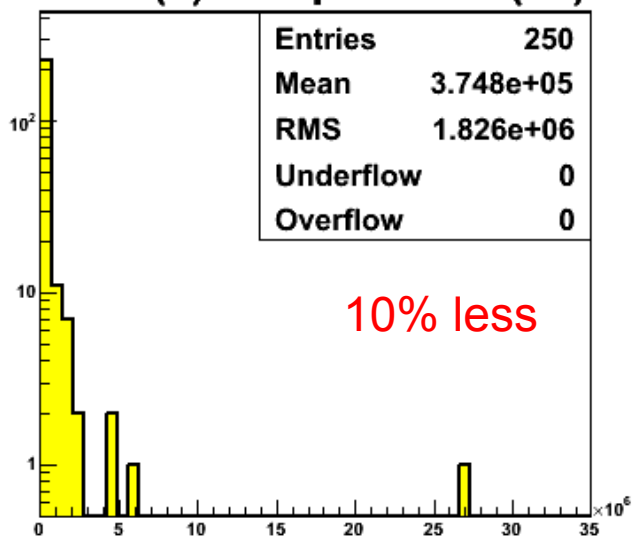


### ALL(1): fits per event(maj)

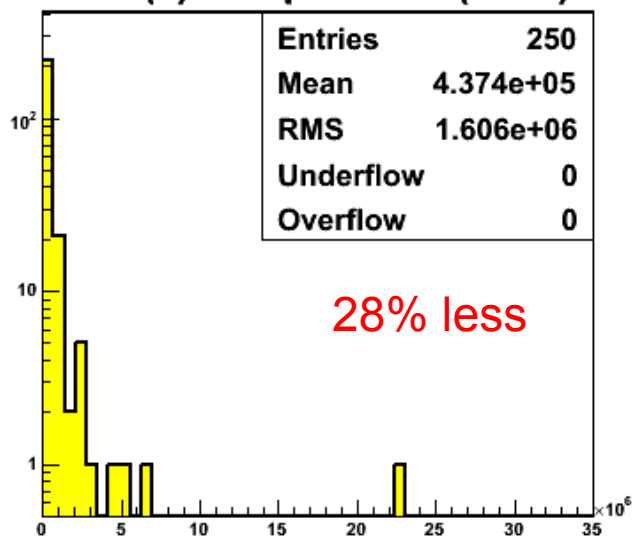


## Default bank + road filtering via shifted bank

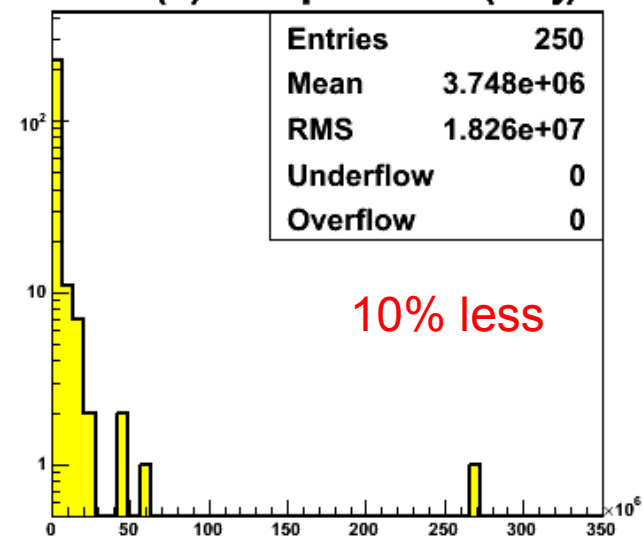
### ALL(1): fits per event(all)



### ALL(1): fits per event(miss)



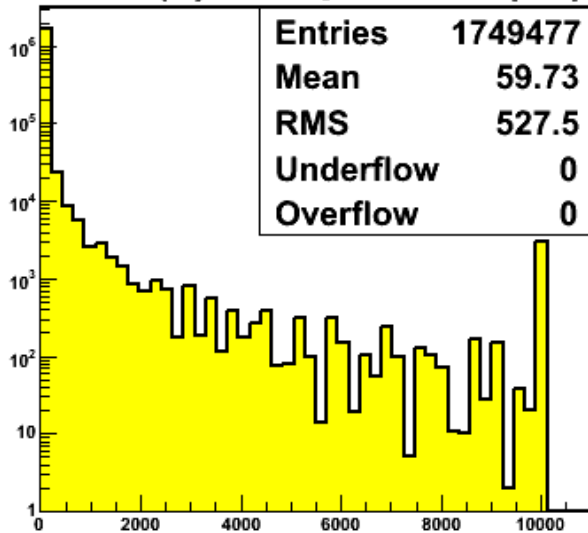
### ALL(1): fits per event(maj)



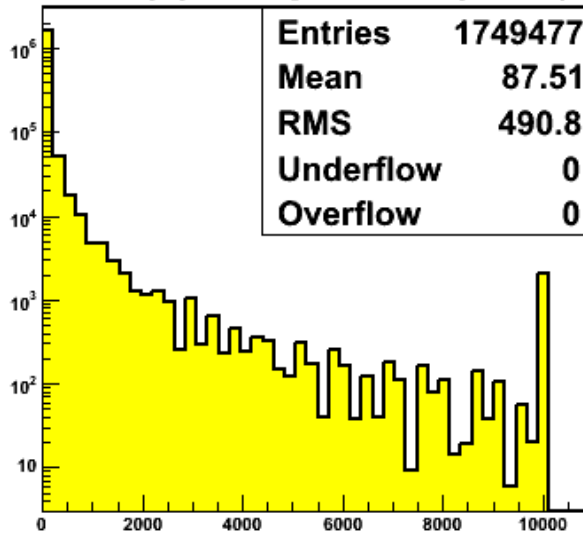
# Average # fits per road

Default bank

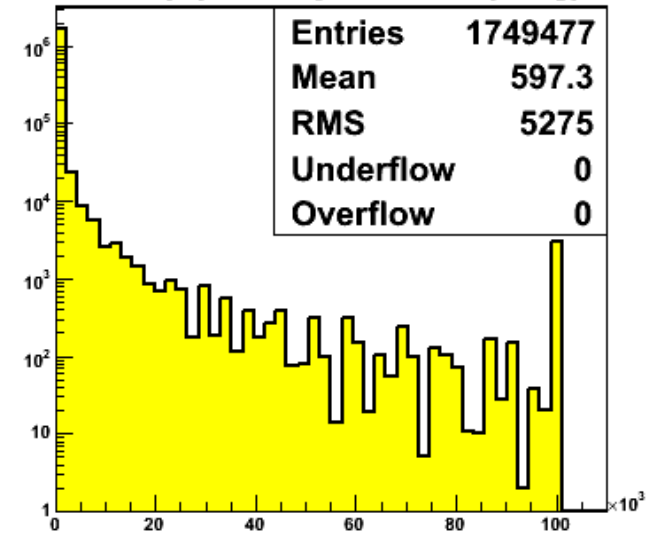
ALL(1): fits per road(all)



ALL(1): fits per road(miss)



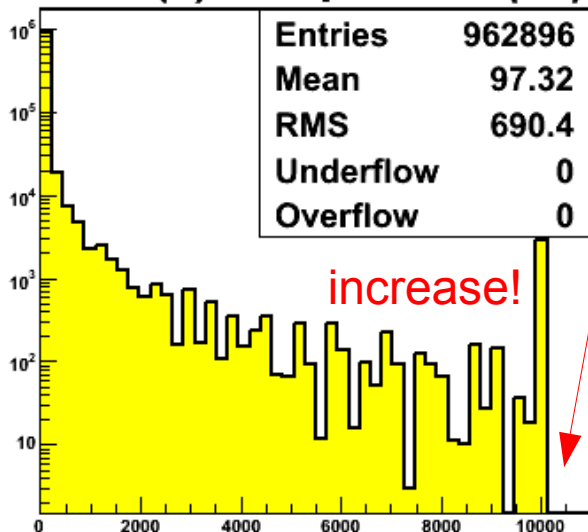
ALL(1): fits per road(maj)



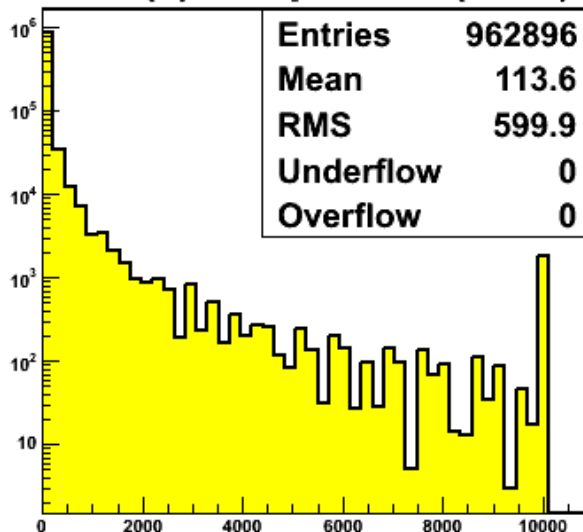
10k cut-off

Default bank + road filtering via shifted bank

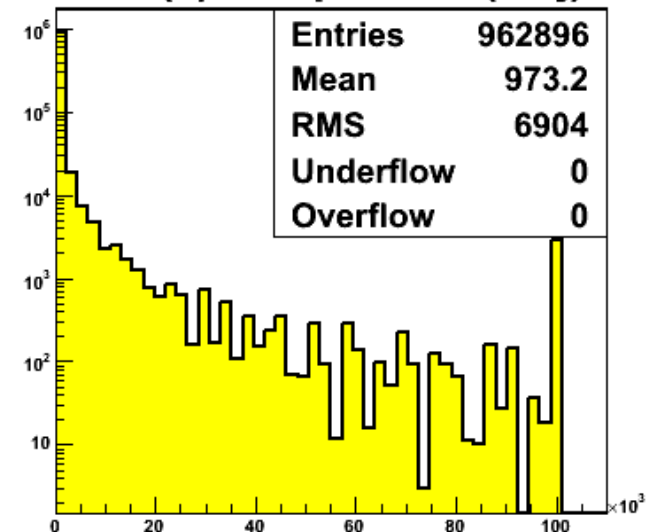
ALL(1): fits per road(all)



ALL(1): fits per road(miss)



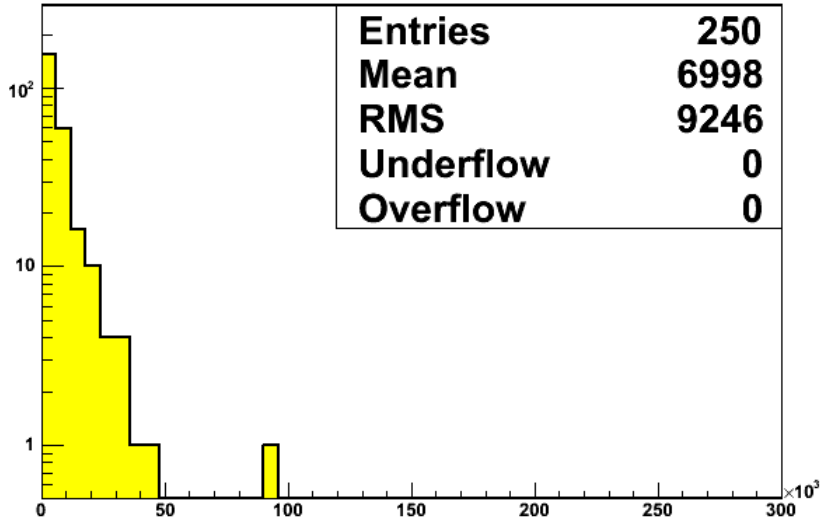
ALL(1): fits per road(maj)



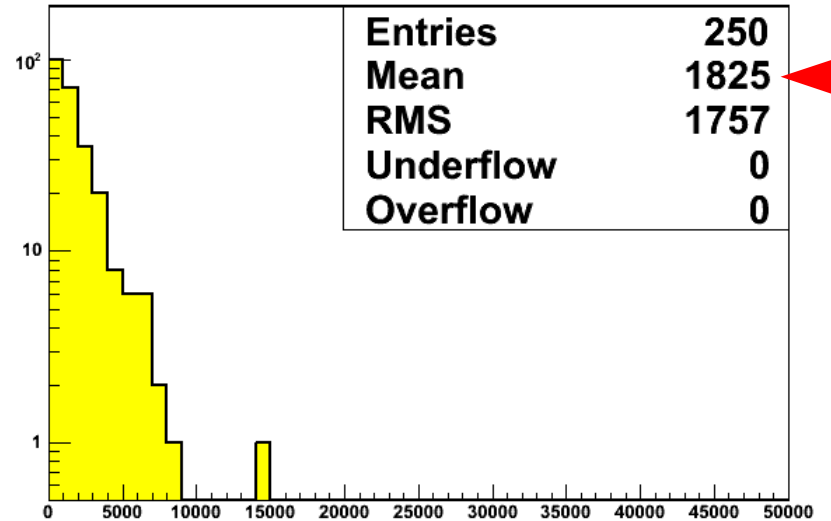
We filtered away "bad" roads. The roads that are left are good, and have more hits in them

Default bank

**ALL(1): number of roads per bank**

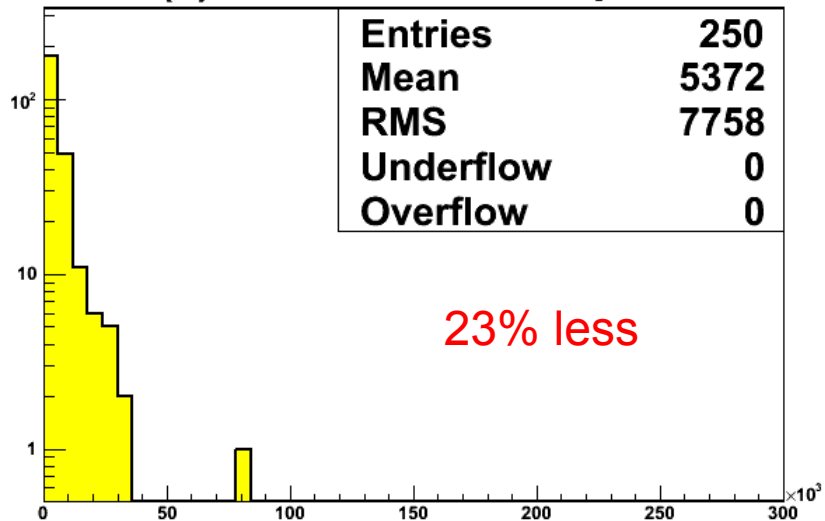


**ALL(1): number of sectors per bank**

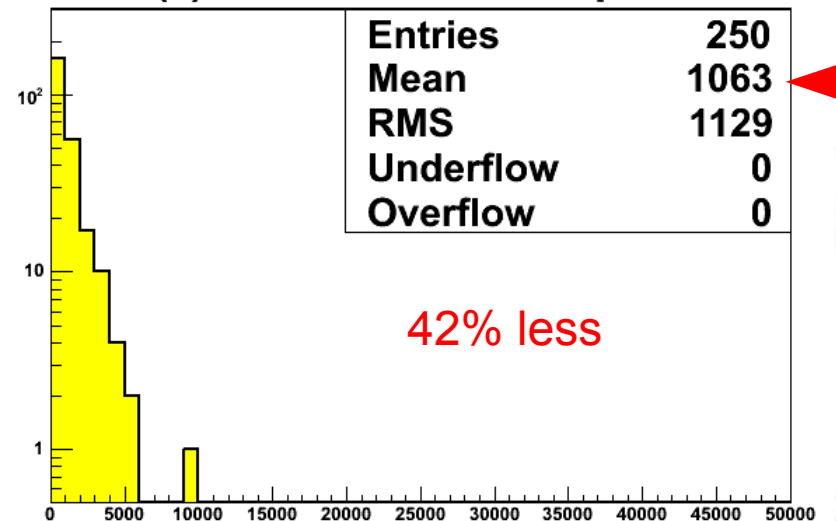


Default bank + road filtering via shifted bank (sector cut only)

**ALL(1): number of roads per bank**

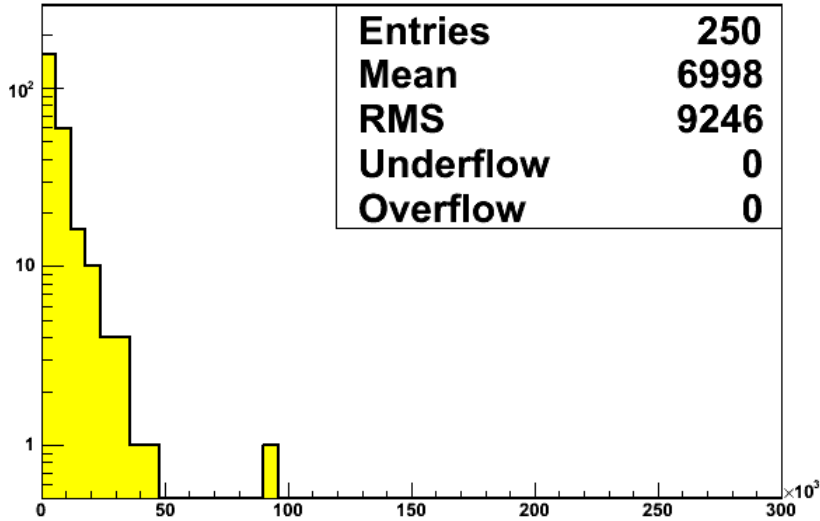


**ALL(1): number of sectors per bank**

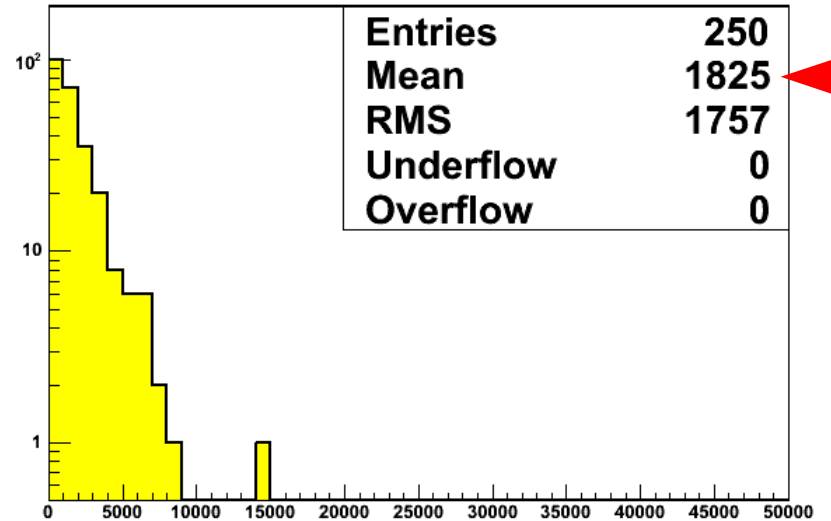


Default bank

**ALL(1): number of roads per bank**

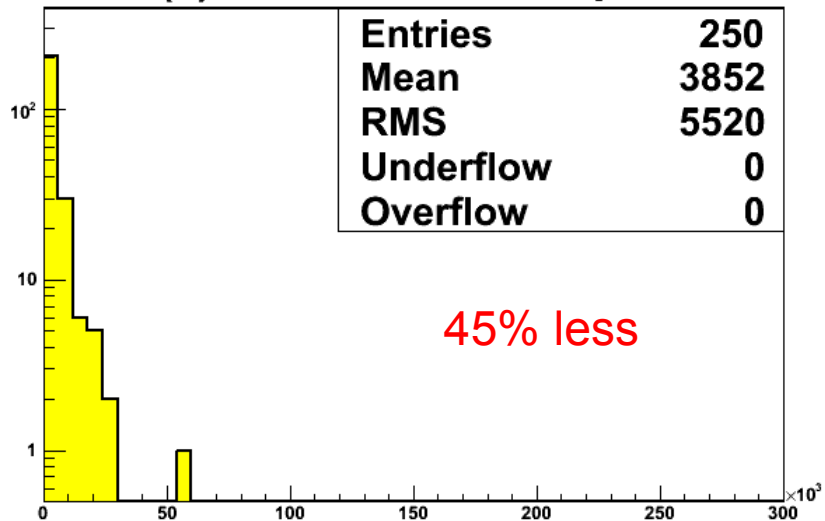


**ALL(1): number of sectors per bank**

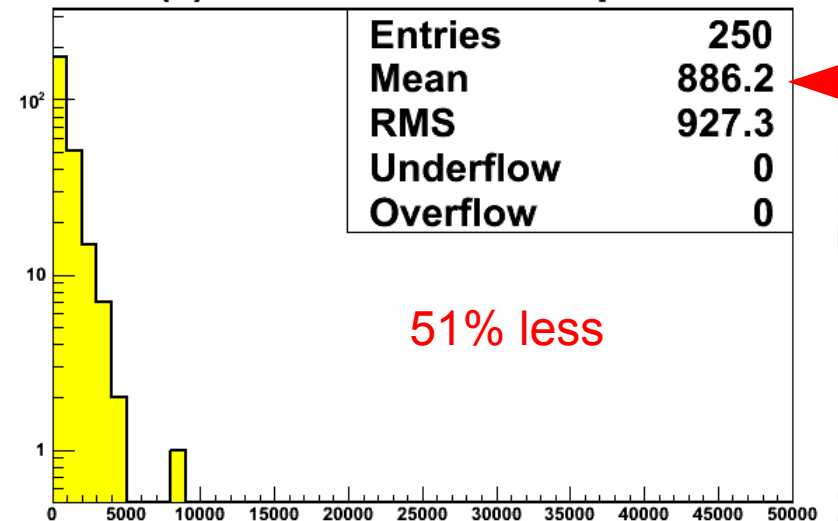


Default bank + road filtering via shifted bank

**ALL(1): number of roads per bank**



**ALL(1): number of sectors per bank**



# Observations

- Procedure tends to kill many “fake” roads, which don't have many hits anyway
  - Total reduction in #fits is 10% - 20%
  - But: we are still fitting in the entire SS width!
    - Expect far greater reduction in #fits!
- Huge reduction in #sectors –can help greatly with FPGA↔memory IO
- **Caveat:** might not be as useful as it seems:
  - Currently not using cross-sector RW
  - Currently not cleaning bank via Guido's script