Modeling TKR Readout Effects Part 2

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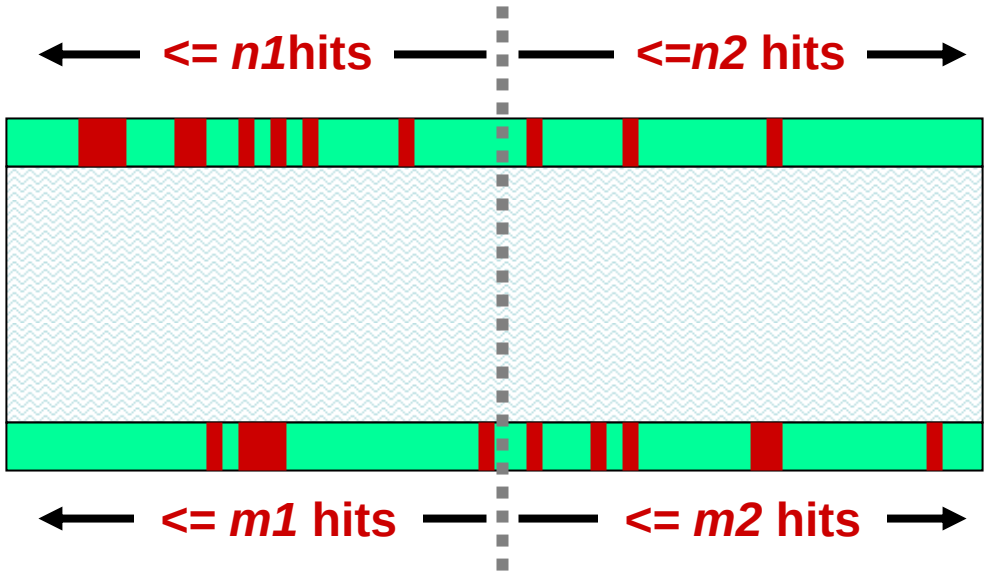
Truncation in each plane

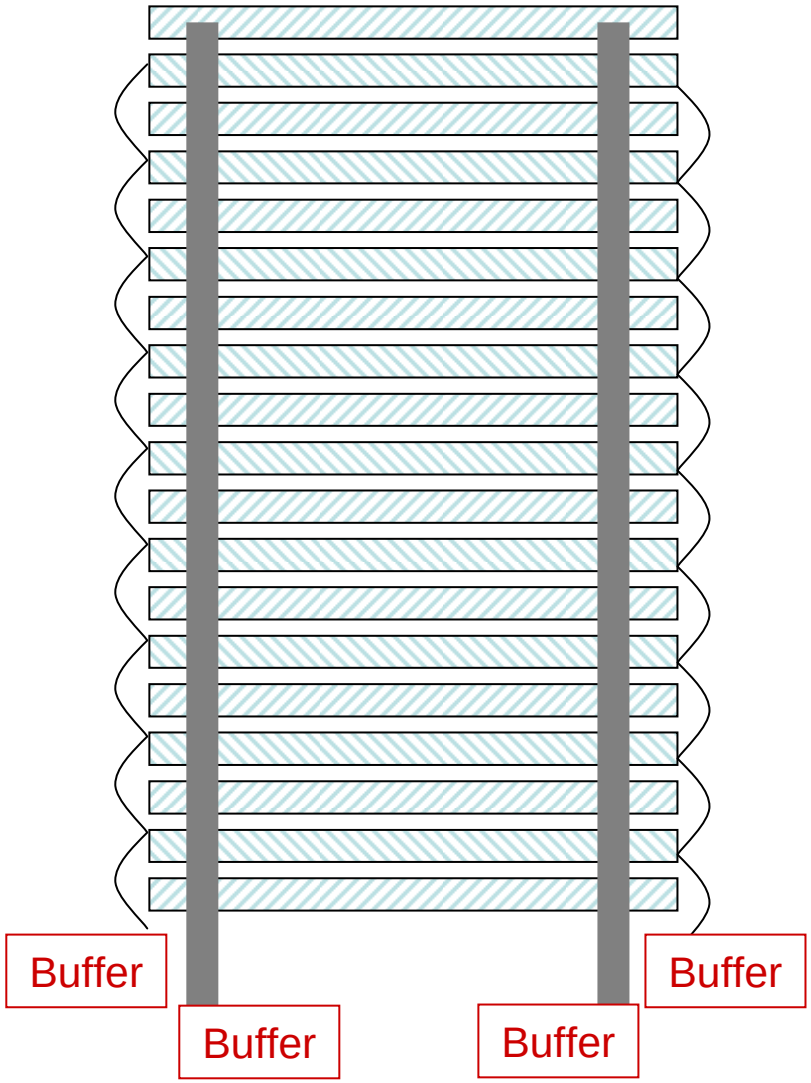


Only the first *m1,2* or *n1,2* hits are kept , where *m, n* <= 64

The limit is adjustable by plane and end

Now also adjustable in Simulation

On each cable



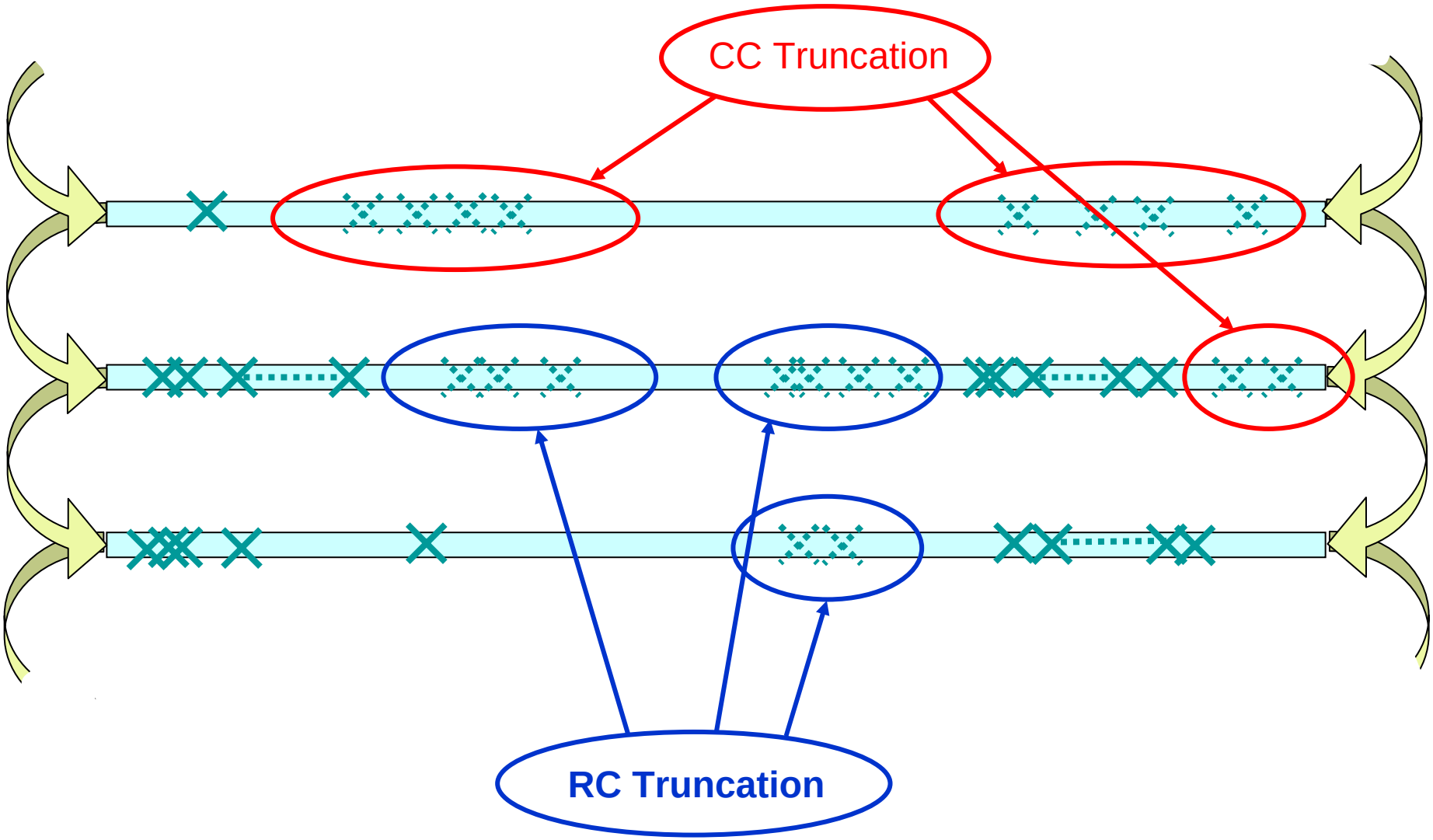
There are 8 cables on each tower. Each cable reads out one-half of one face of every other tray.

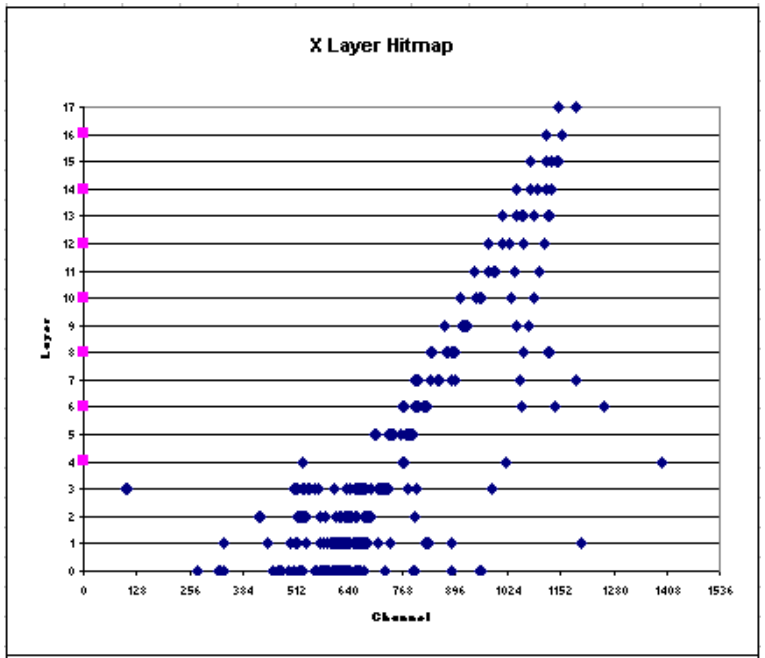
No more than *128* hits can be stored in each cable buffer.

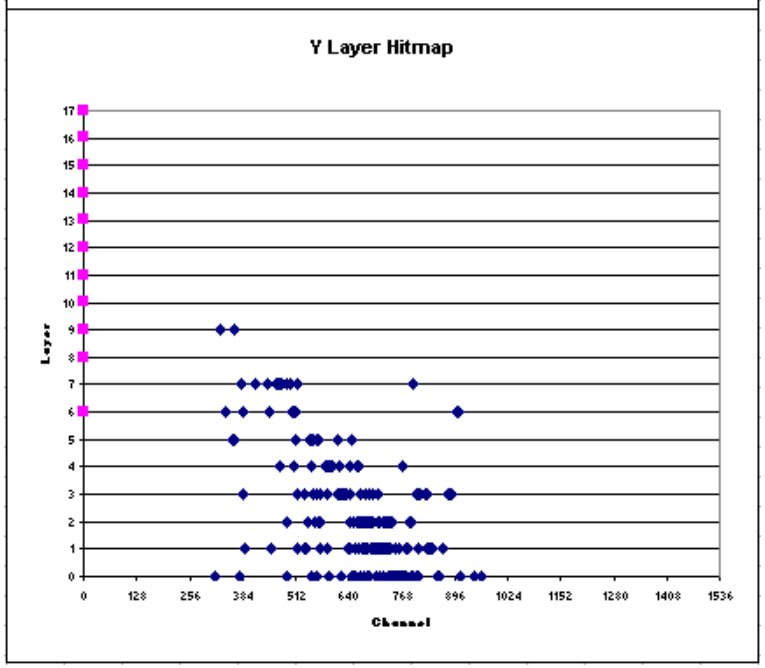
The hits are read into the buffer *from the bottom up,* and *from low to high strip number on each side*

(Now in MC)

Topology of Truncation







An Air Shower
(real data)

In x view, hits at top and bottom of shower are mostly on different cables.

In y view, they are on the same cables, and the top hits are lost.

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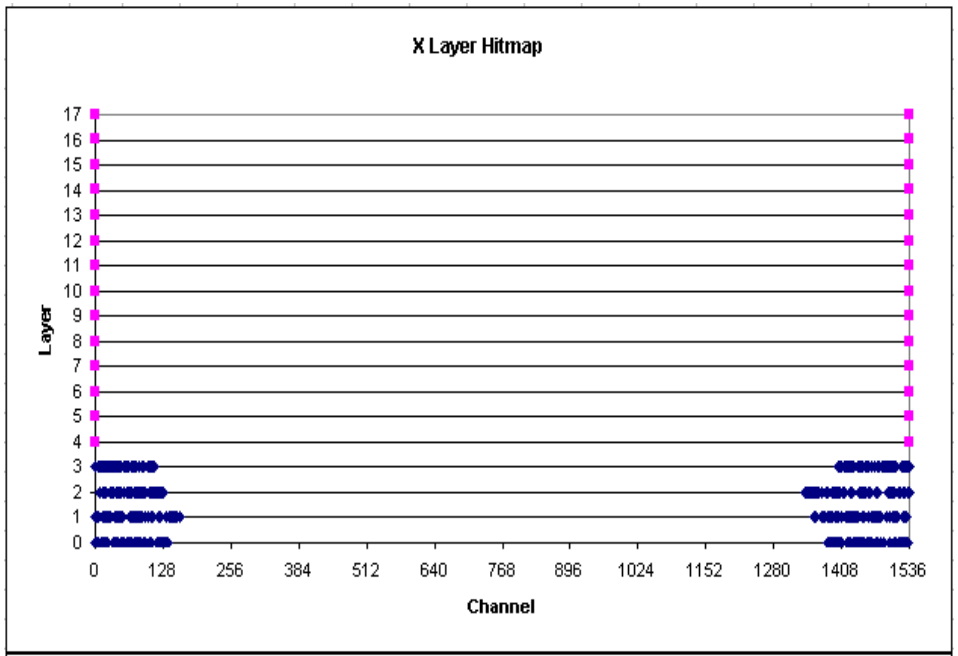
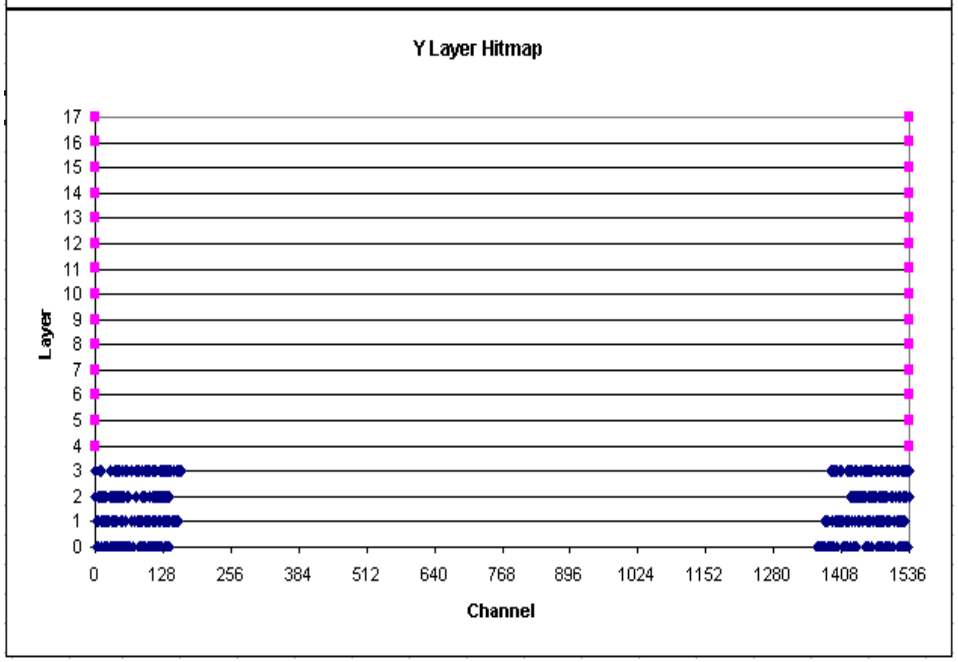
Pink squares mark truncated ends.





Another real event!

Diagnostic info says every plane is truncated to 64 at both ends…

Not much to go on!

Recon Strategy (New)

- For each event, we deduce which planes have potentially overflowed by counting the remaining hits. *(Note: No separate indication exists in the data to flag events which overflow the buffers.)*
- This information is stored in the TDS.
- PatRec looks at this information when it encounters a plane with no hit.
  - If the missing hit is “excused,” patrec continues to the next plane. Other reasons are also checked. (See next slide)
  - If the hit is unexcused, gap counters are incremented, and when a certain number is reached, the track is declared found as is.

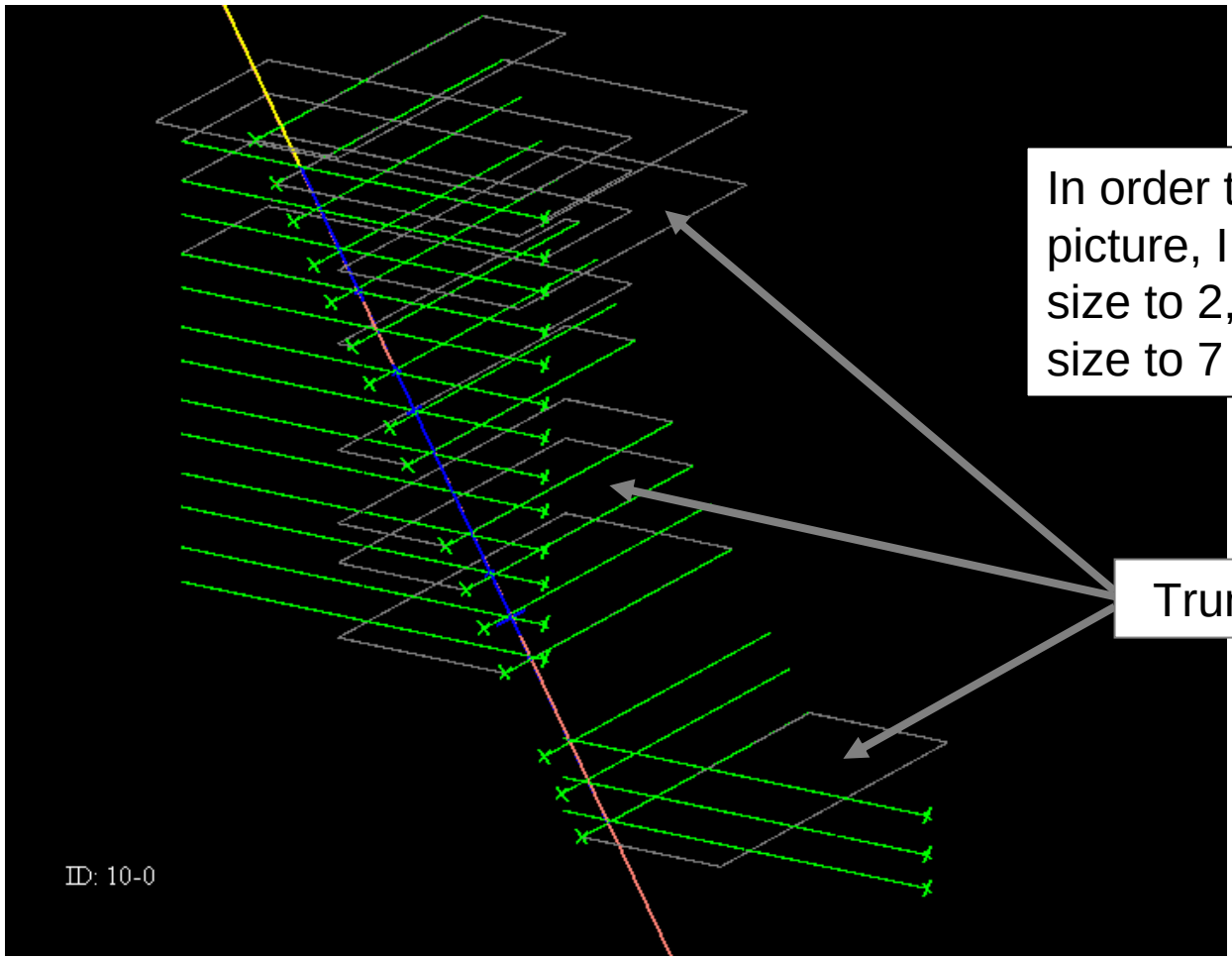
Reasons for excused absences

The missing hit is excused if the extrapolated track passes

- through a failed plane
- outside active area of tower
- through a gap in a plane
- through a region made insensitive by truncation
- near one or more dead strips.

The tests are performed in the order shown (in approximate order of decreasing probability).

FRED displays truncated regions



In order to generate this picture, I set the RC buffer size to 2, and the CC buffer size to 7

Truncated regions

But no good way to look at really big events …

Rough test of Effect of Truncation

Source is 1000 all_gammas between 100 and 300 GeV, in 3 configurations:

- No truncation
- Standard truncation
- Simple tailoring: All RC buffers set to 14
  (14*9 = 126 < 128)

Result: 292 Triggers

	nTracks>0	DirErr<0.1	DirErr<0.005	mean
No truncation	**154**	**96**	**74**	**0.00185**
Standard	**157**	**98**	**77**	**0.00178**
Tailored	**161**	**98**	**78**	**0.00180**

No obvious problem caused by truncation!