SiPixel Quality Q&A

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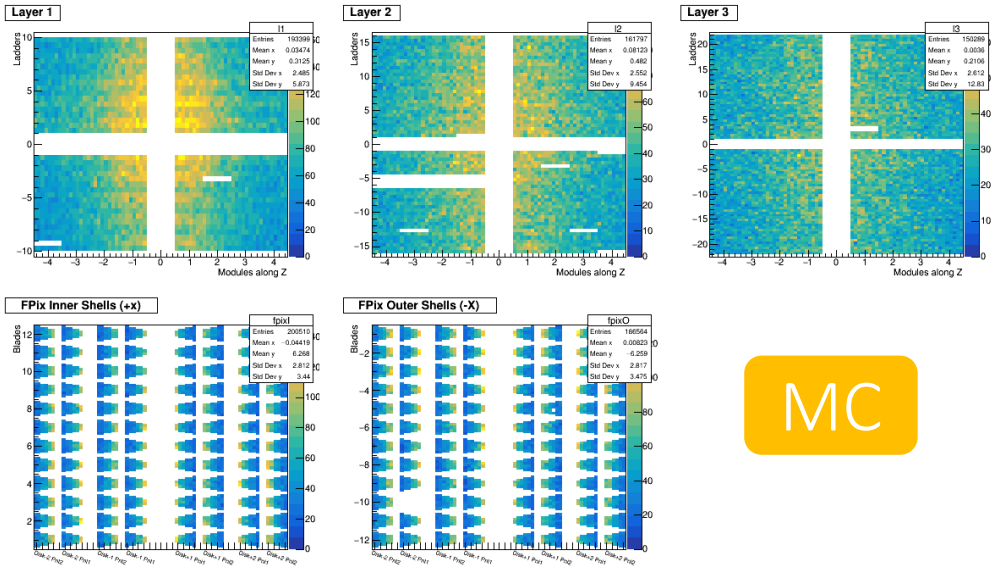
How can we make sure that the payload content is correct?

We are doing internal validation using occupancy plots (MC and data)

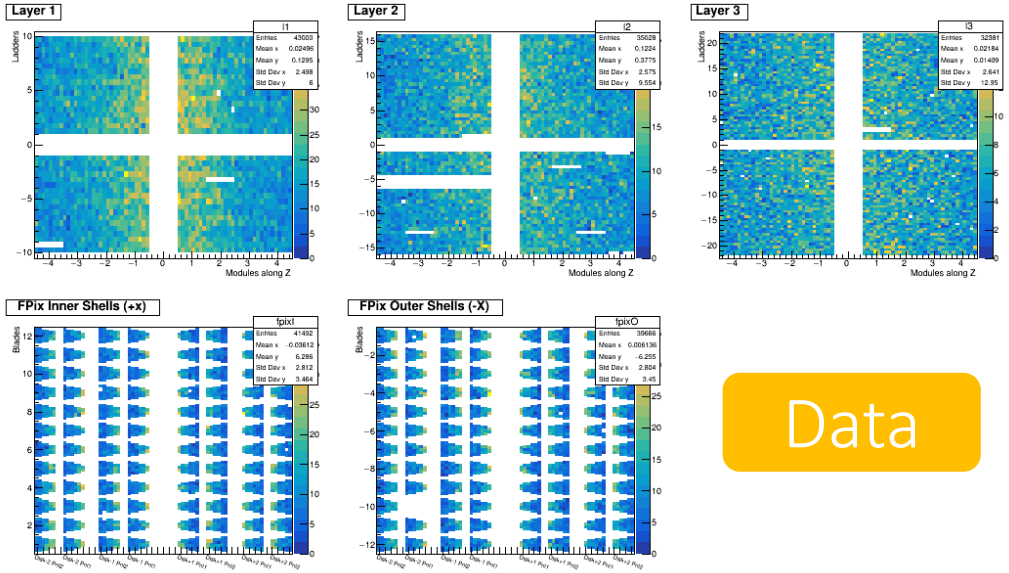
(a) MC plot: a perfect detector is simulated until the RAW step, then in the raw2digi the payload is applied –> every hole in the occupancy map is due to the Quality

(b) data plot: plotting the occupancy from data that is in the given period

How can we make sure that the payload content is correct?



MC



Data

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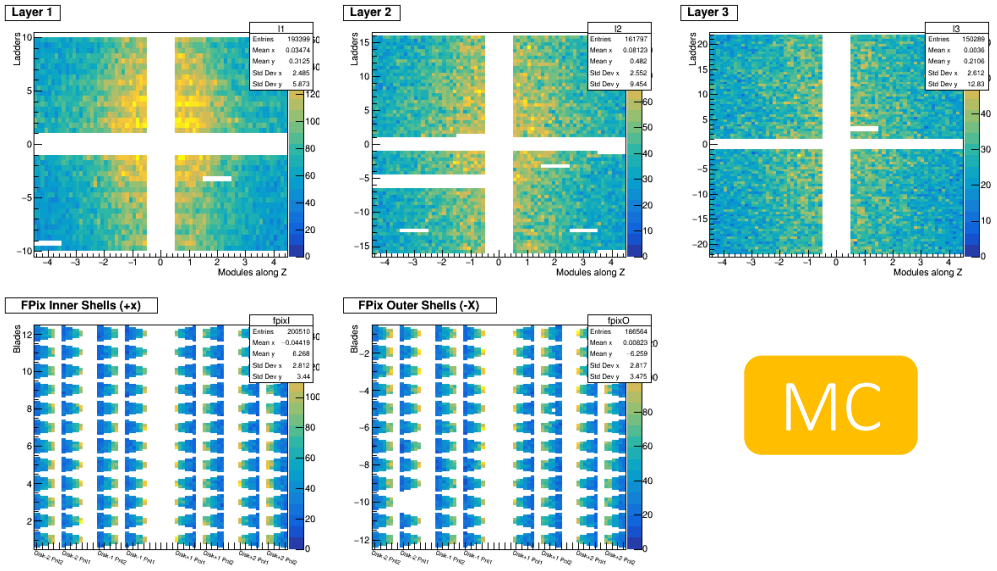
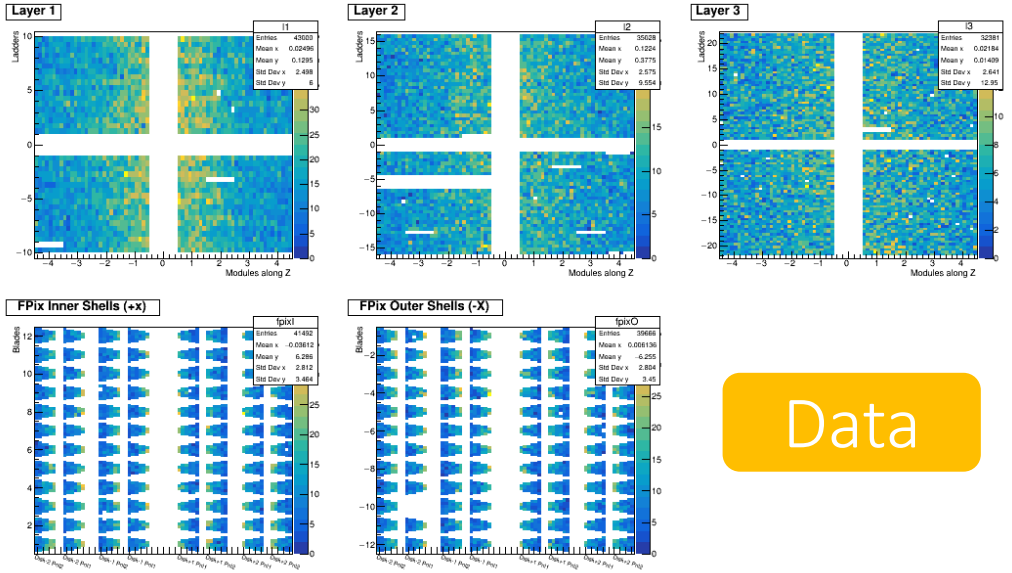


MC



Data

(b) was not done in case of v36 –> cause of the avalanche of questions

Solution: have to be more careful in the future

What is the effect on tracking?

The unit of SiPixelQuality is a ROC.

The Quality reader can differentiate between completely dead and partially dead modules (link and link)

Thus the code is written like that tracking can use the working part of the module

What is the effect on tracking?

Quality has no effect on seeding

It disables the layer when looking for a valid hit during track finding

So a dead module will not contribute to the missing-hit count

Therefore it will not discard the track if the limit is reached

When should we update?

Is the change permanent?

Yes

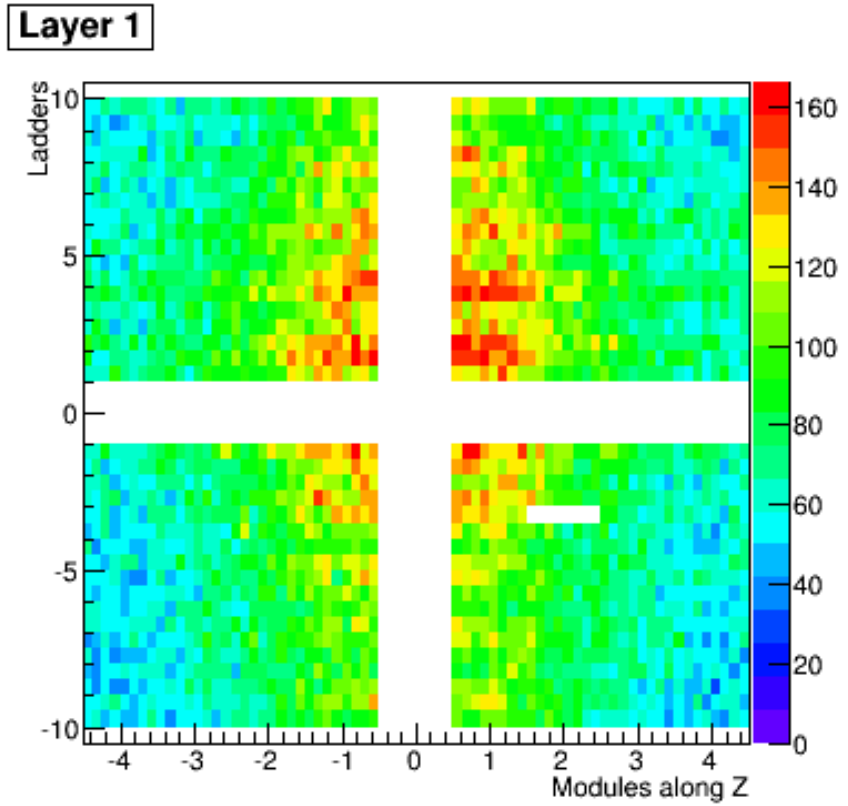
- In 2012 and 2015 we even put ROCs
- Maybe the half module threshold is better

No

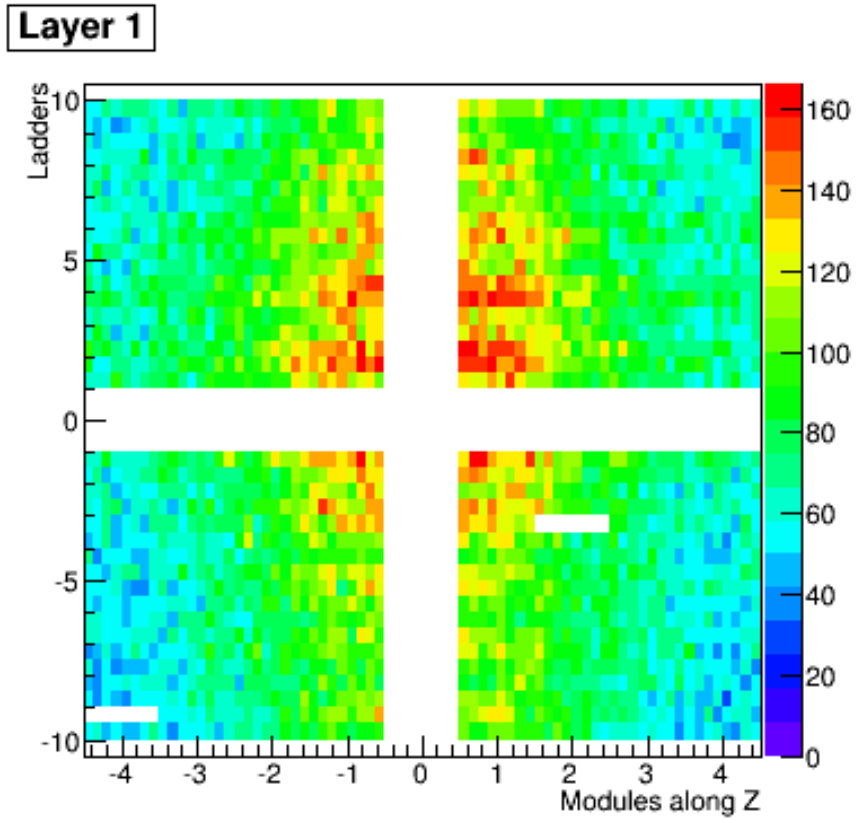
- In case if we know that it will be bad for more then a fill
- Threshold should be a whole module

Consistency of MC payload with data?

Simulation



Current detector status



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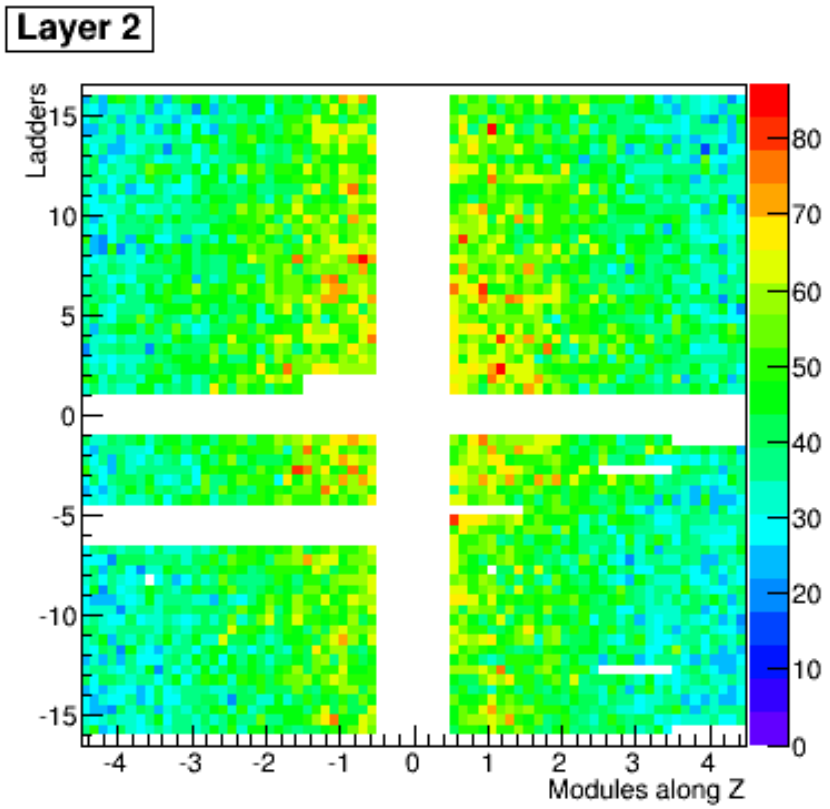

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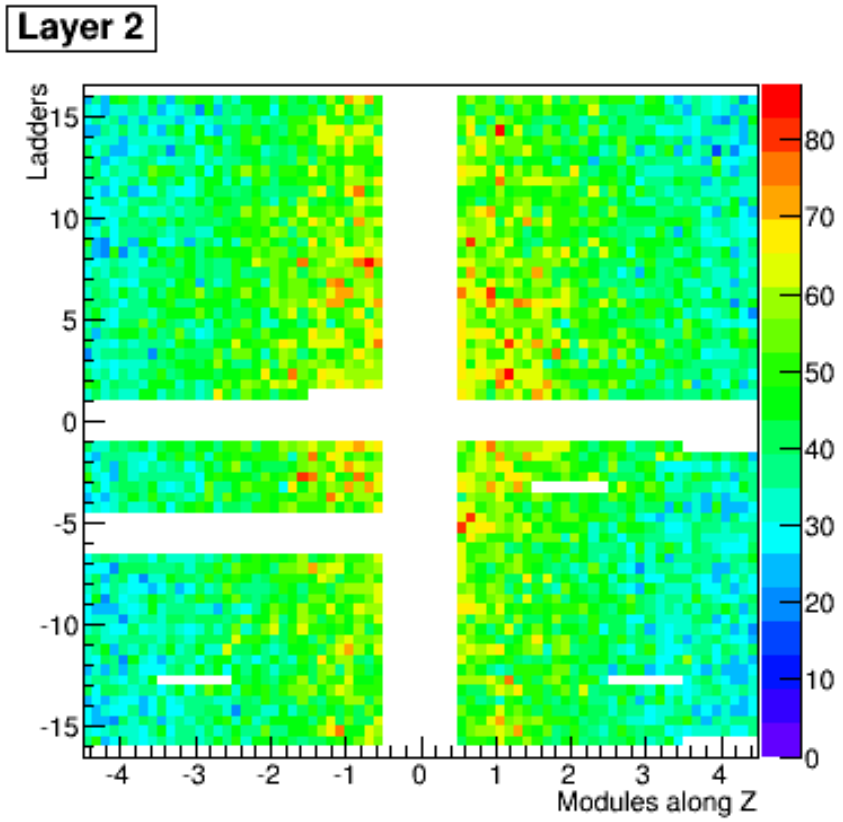

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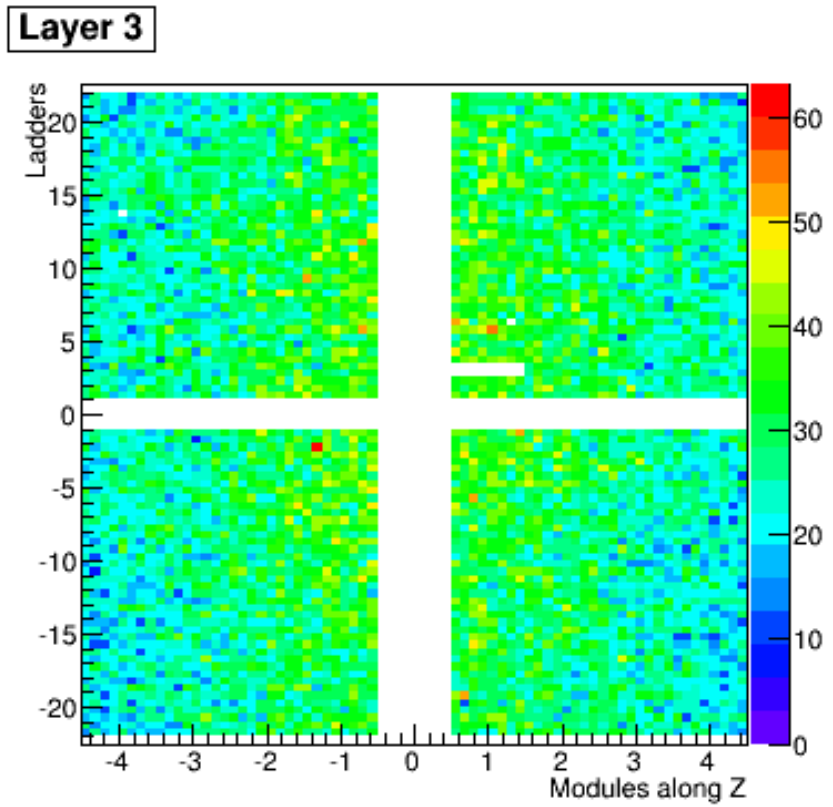

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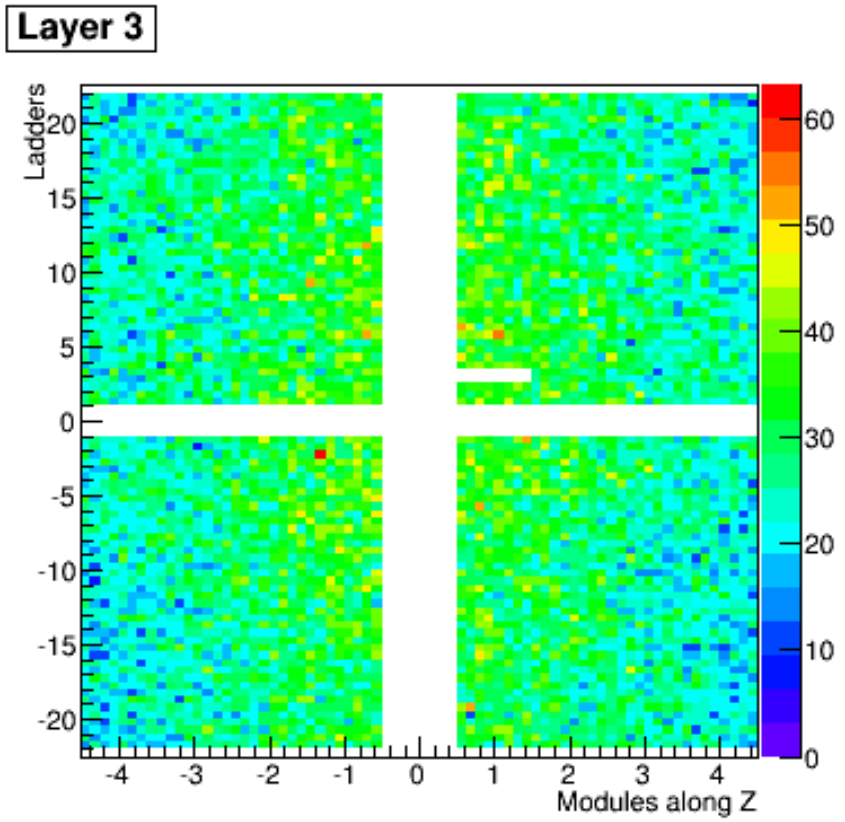

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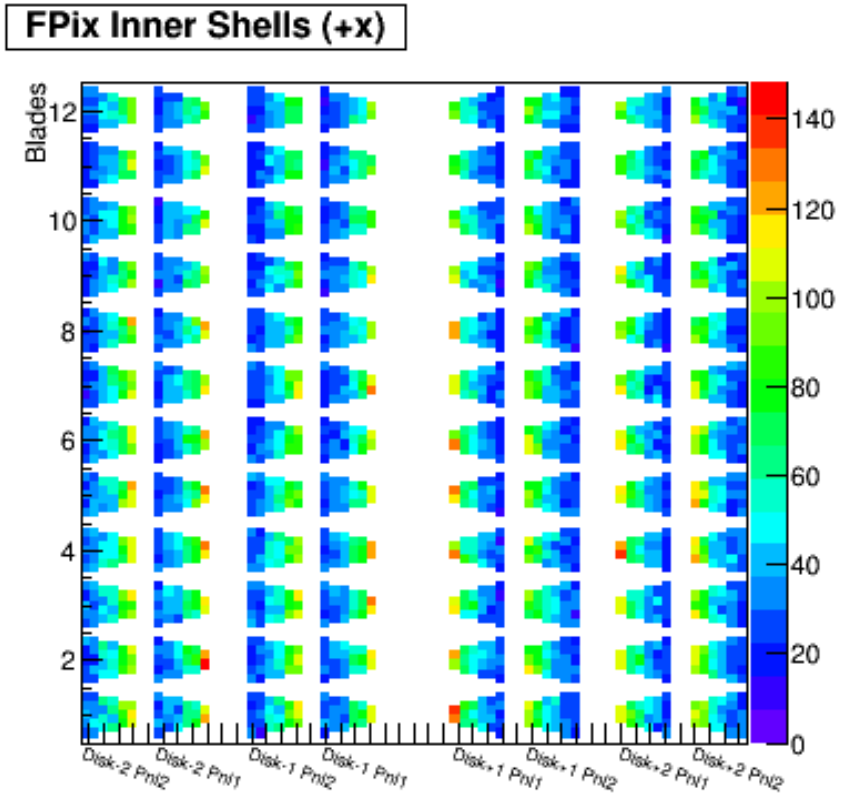

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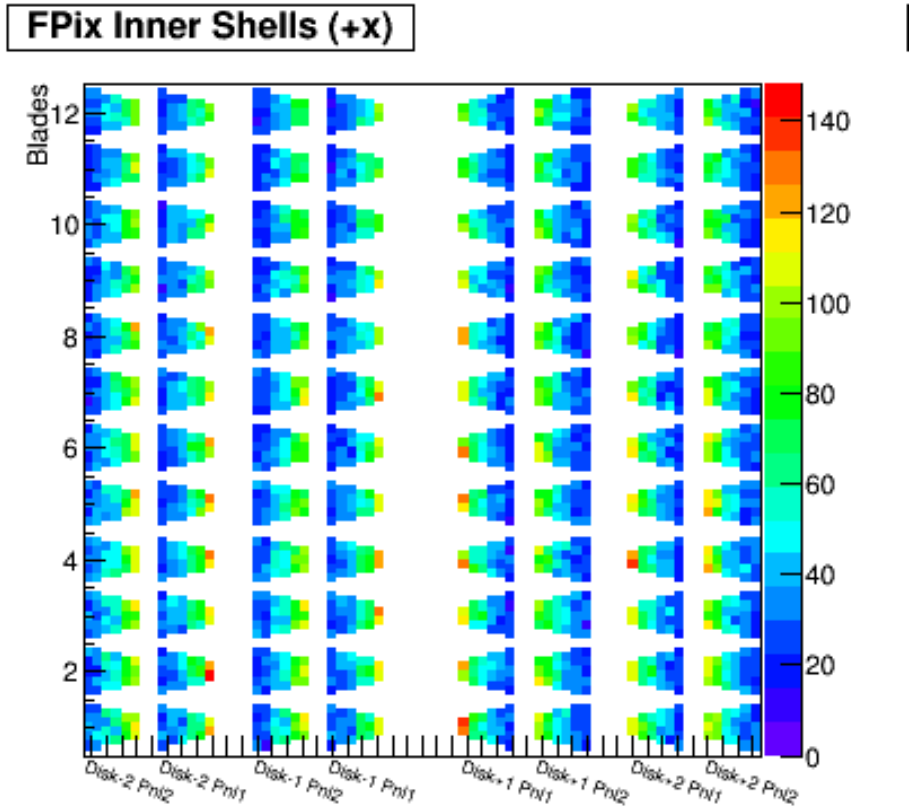

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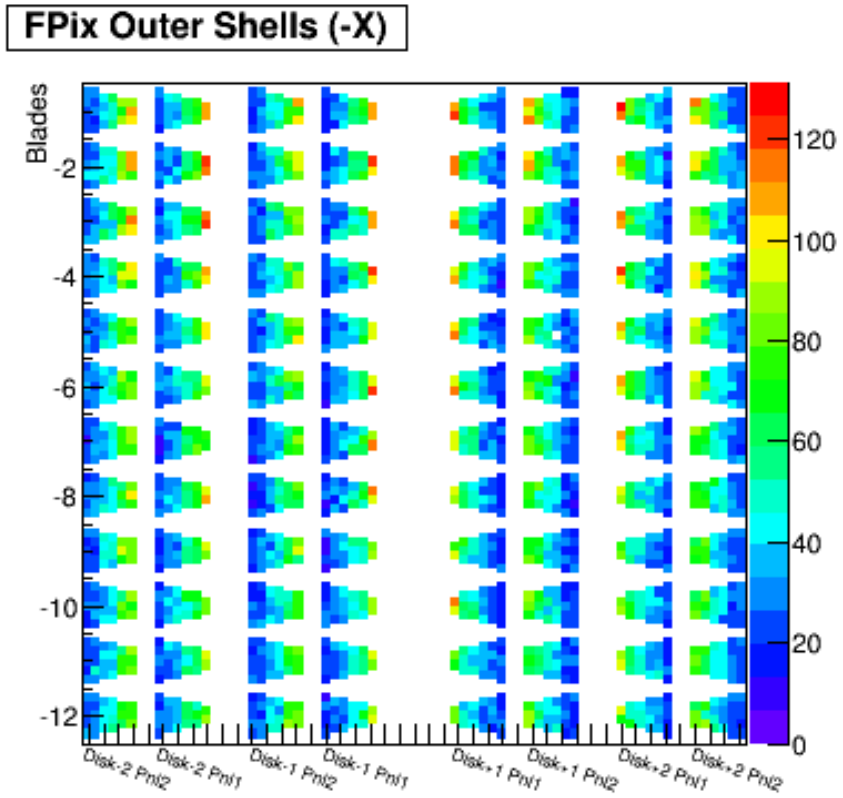
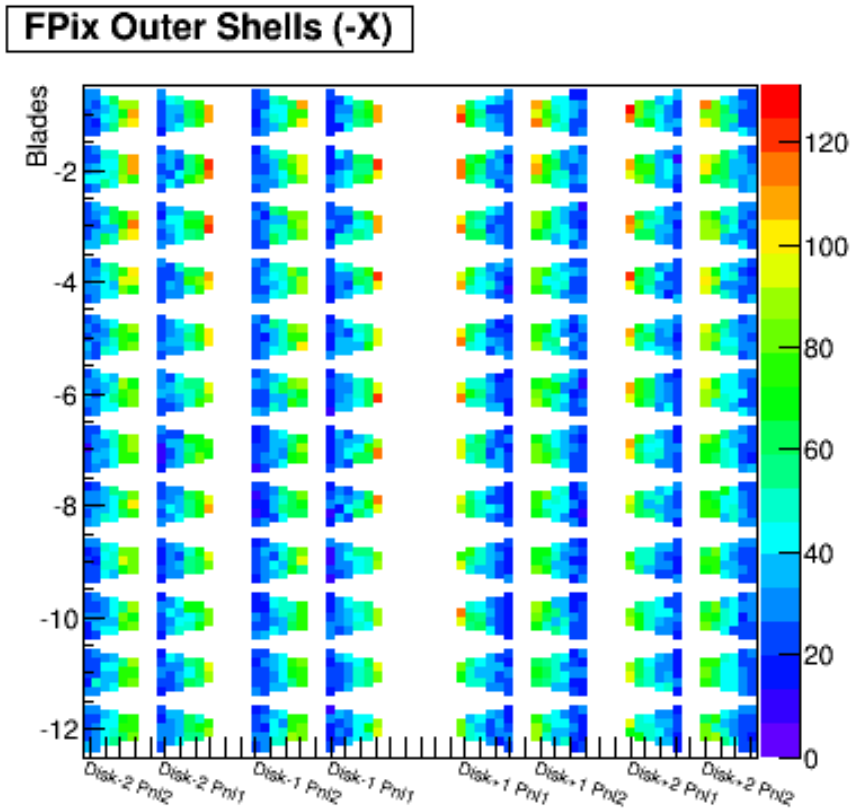


Current detector status



Consistency of MC payload with data?