Strip to Strip Calibration Update

Jeff de Jong (IIT)

Calibration WG Phone Meeting

February 2nd,2006

Outline

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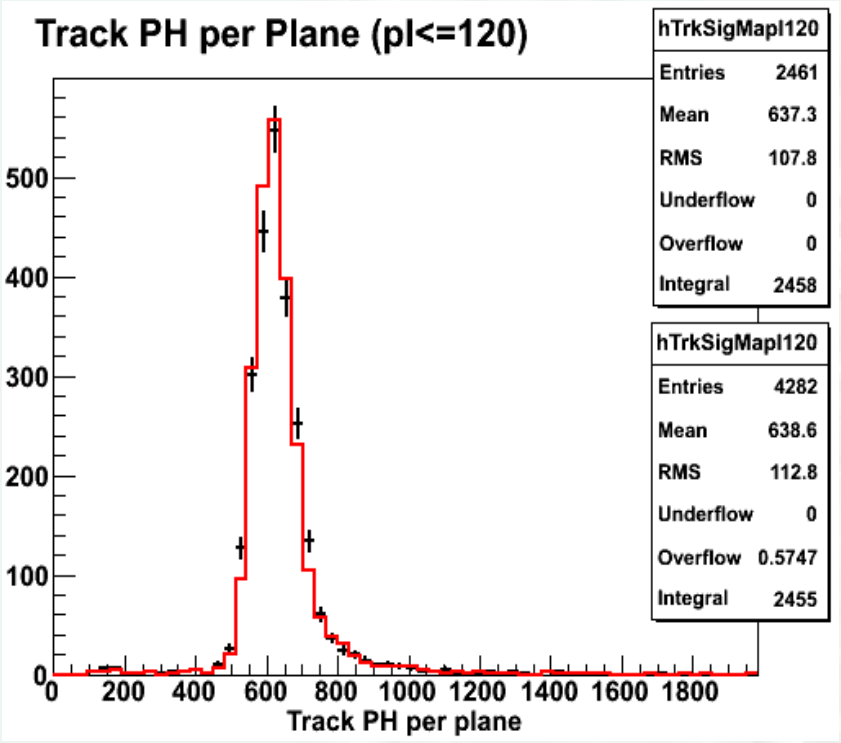
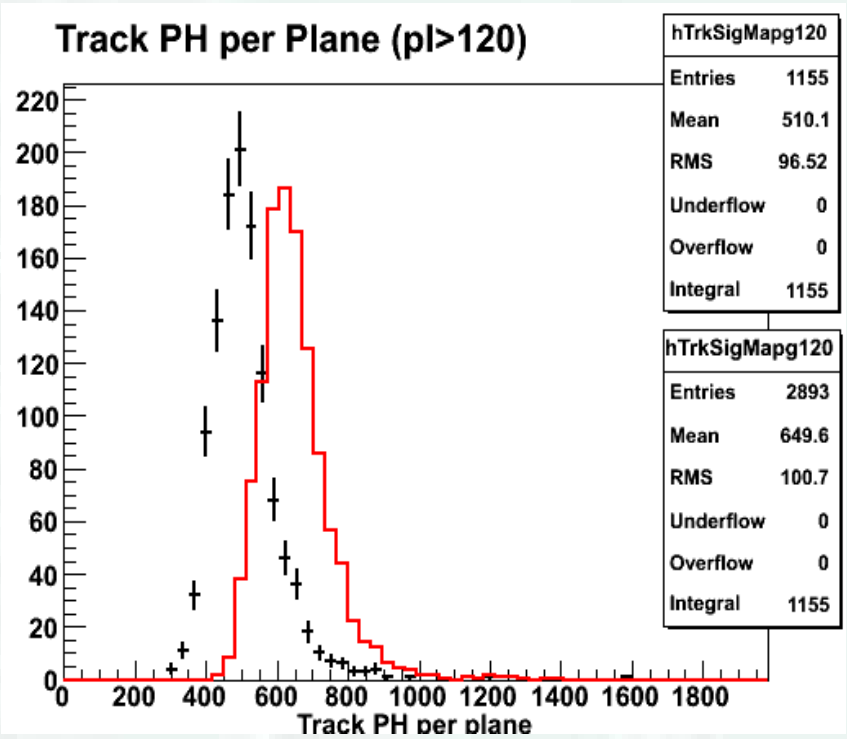
- Clear Fibre Length Issue
- Strip 2 Strip analysis Status
- Bugs in the S2S technique

From The Collaboration Meeting

Niki presented the following plots at the MINOS collaboration in Oxford.





Black is data.
Red is Monte-Carlo.

In the spectrometer region the MC predicts values **that are 20% higher** than the data.

The Database Issue

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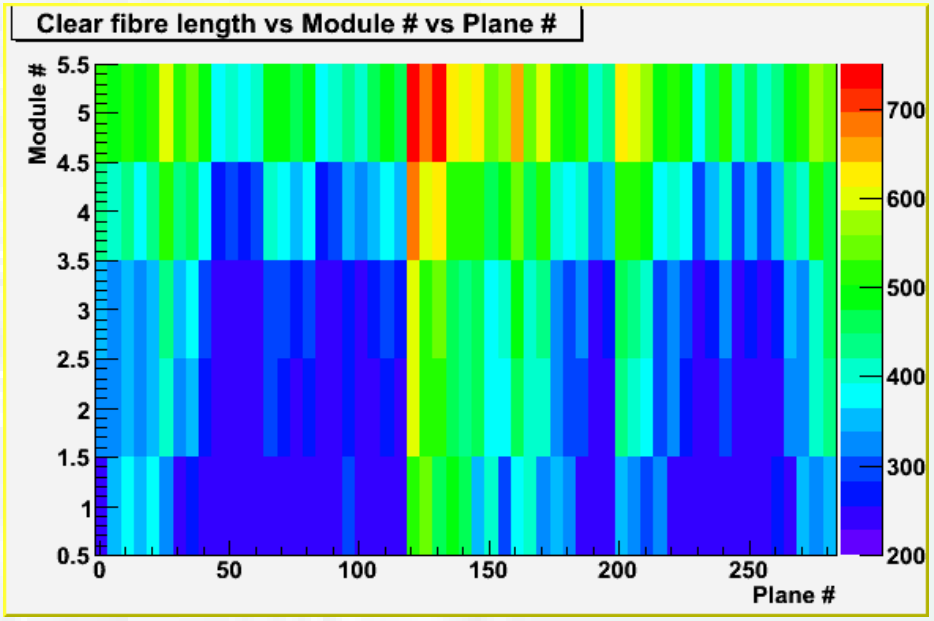
The database contained incorrect values for the clear fibrelength.
Corrected by R. Hatcher ~ Jan 25



- Clear fibre lengths as listed in the database.

- The true clear fibre length is no where near to what exists in the database.
- A 3 m discontinuity between the calorimeter and the spectrometer (λ~12 m or 15%ish)

Clear Fibre Attenuation Ratios

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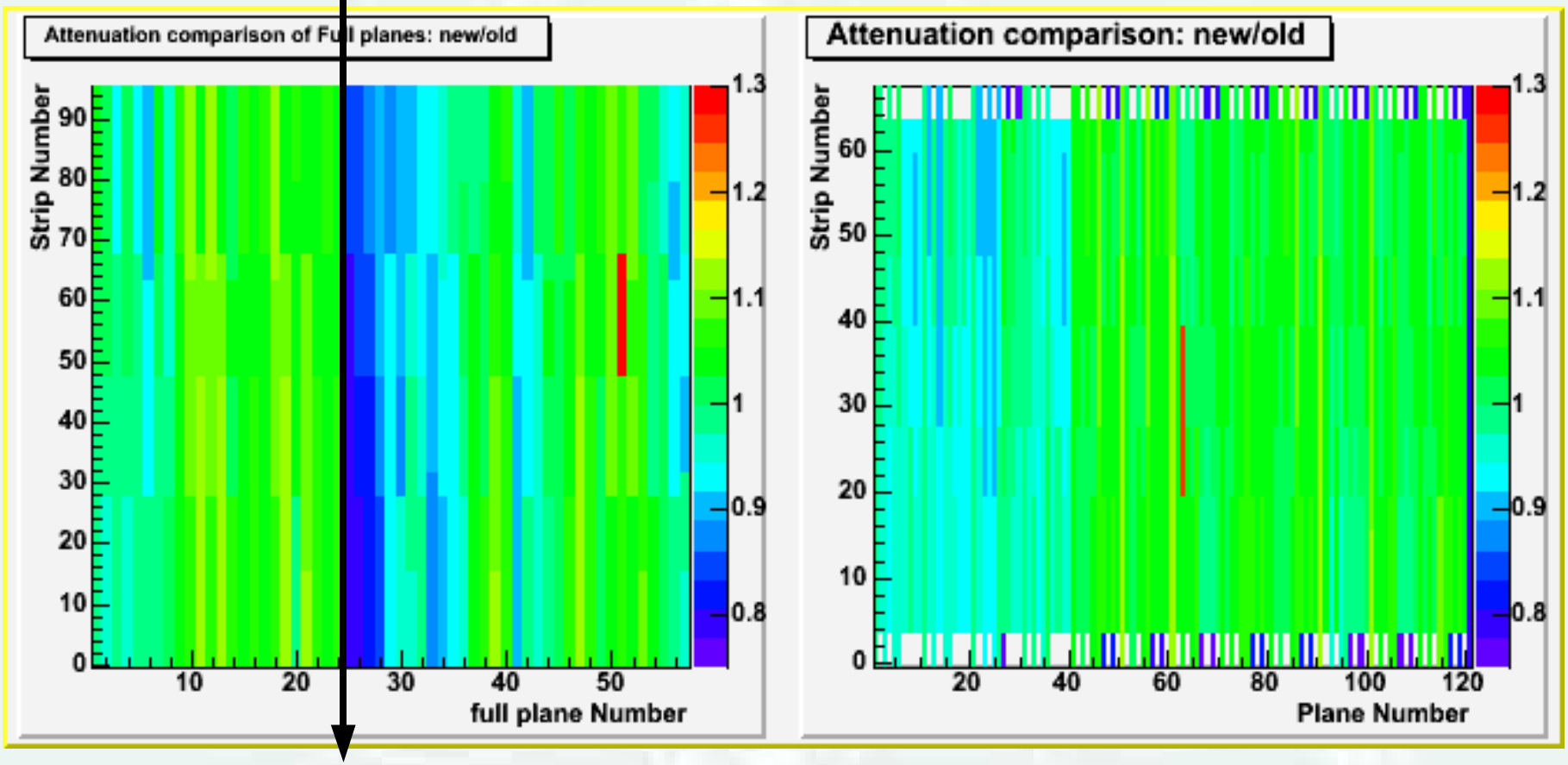
Assume a clear fibre attenuation length of 11 m

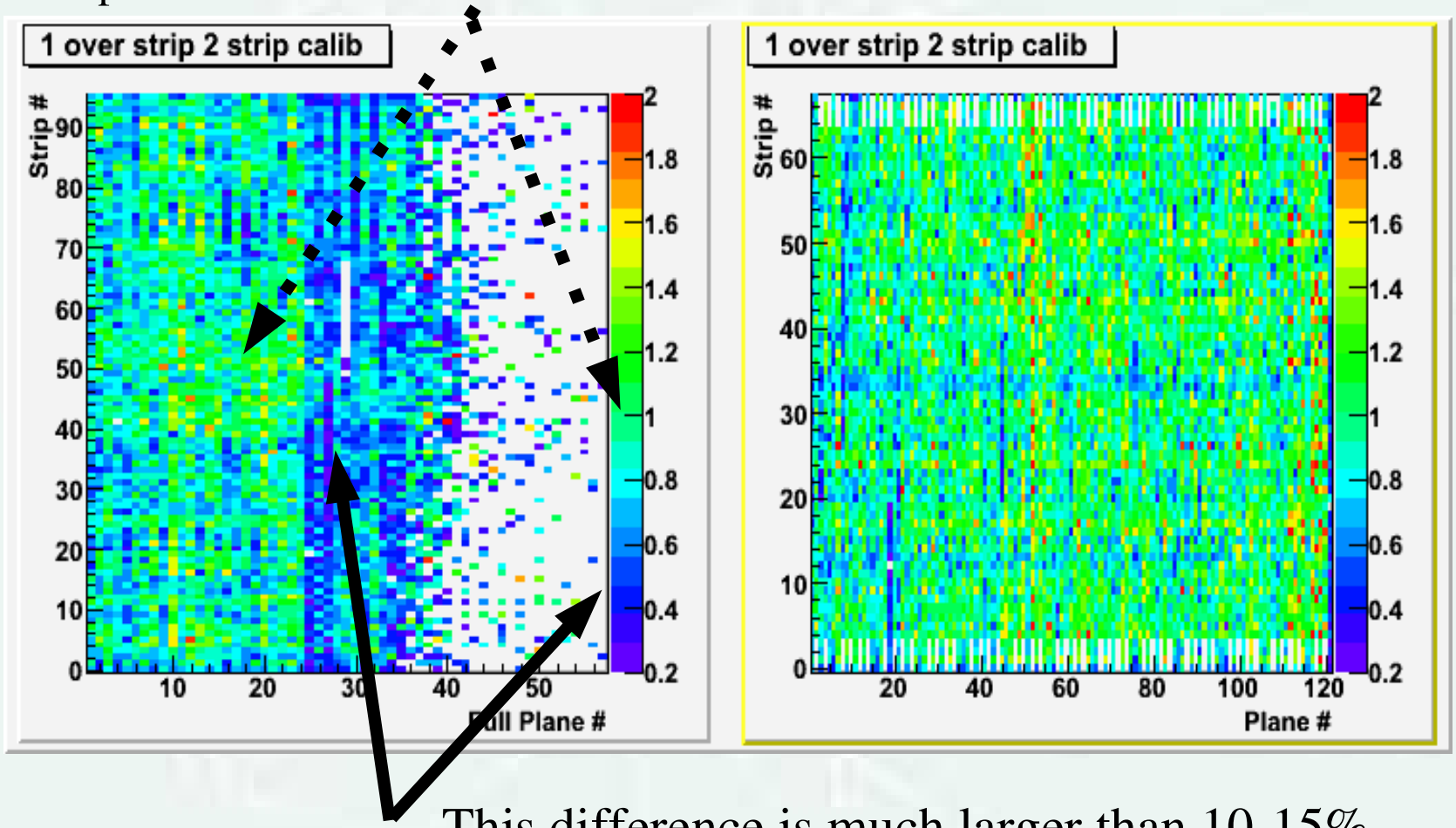


- There is a difference in attenuation by 15-20% in the front end of the spec.

→ The DB should only affect the MC!

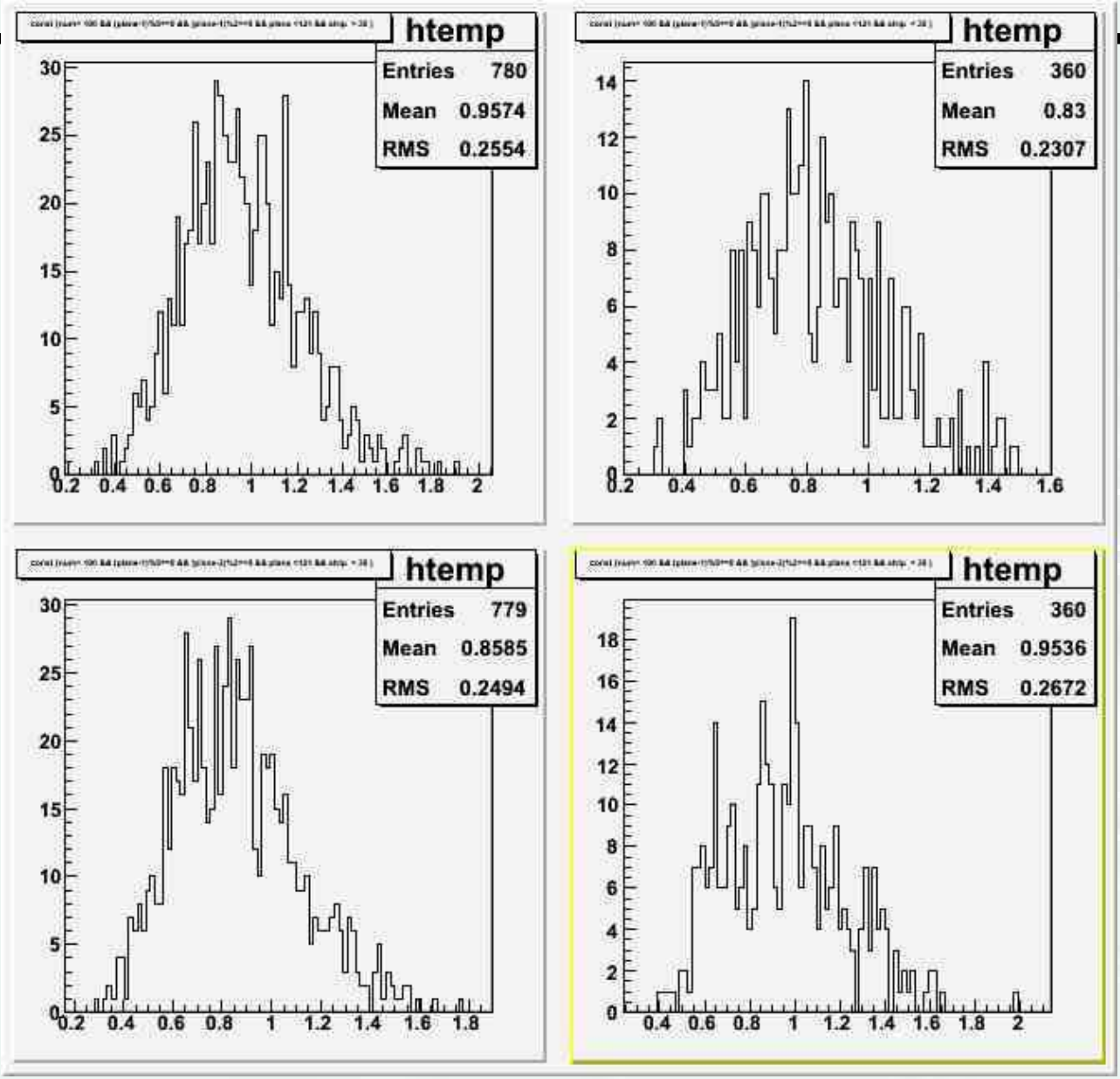
Effect on Strip to Strip Calibration?

This clear length fibre effect *should have no effect* on the strip to strip method other than making the s2s calibration constant LARGER in the front end of the spectrometer.



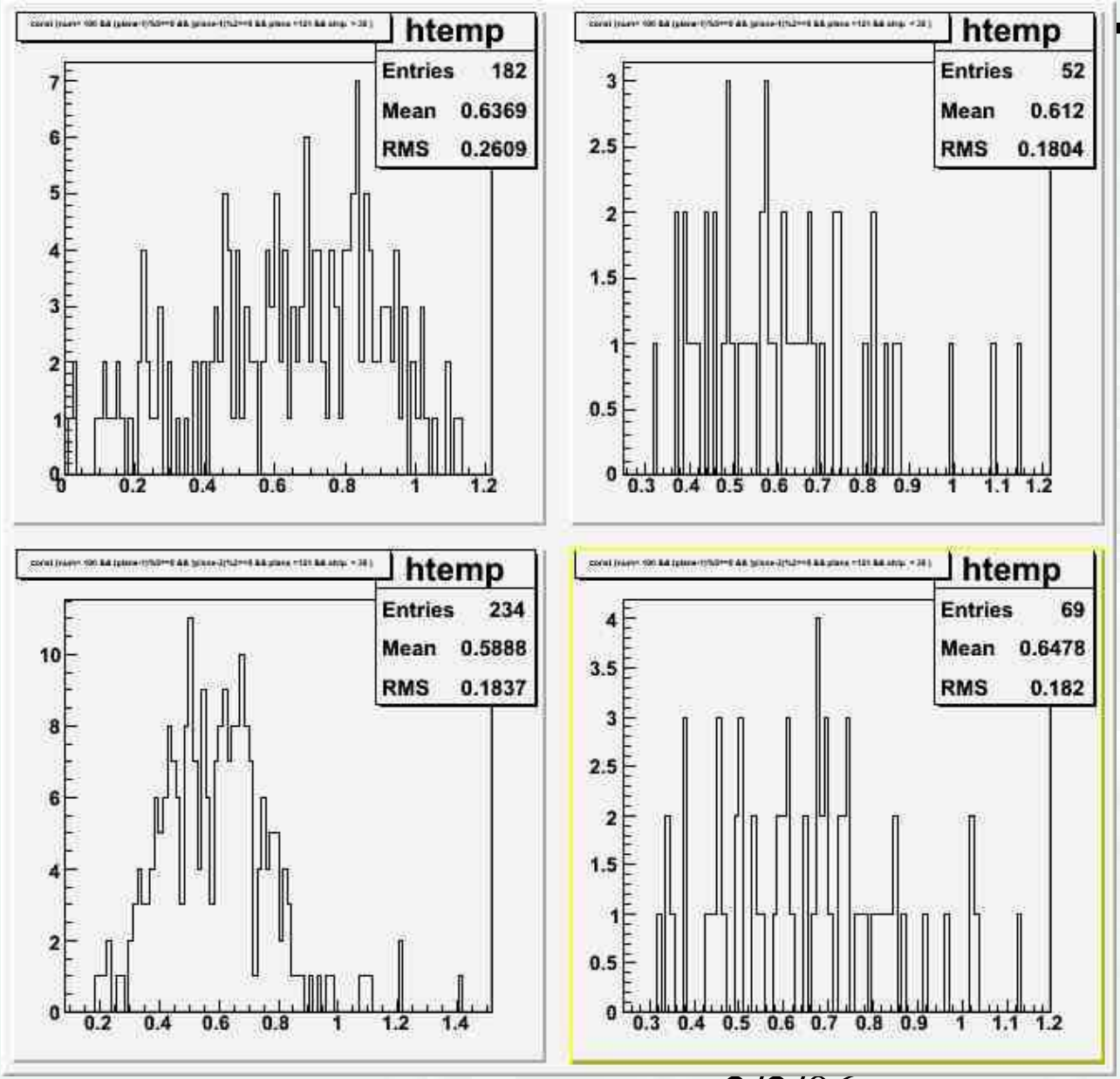
This difference is much larger than 10-15%

Plane # < 121 : Full planes



1/s2s is larger 0.96 vs 0.85 for strips with shorter clear fibre length.

plane # >121 : Full planes



1/s2s is larger 0.65 vs 0.6 for strips with shorter clear fibre length.

why are these #s so significantly different from the other full planes?

Near Detector S2S Status

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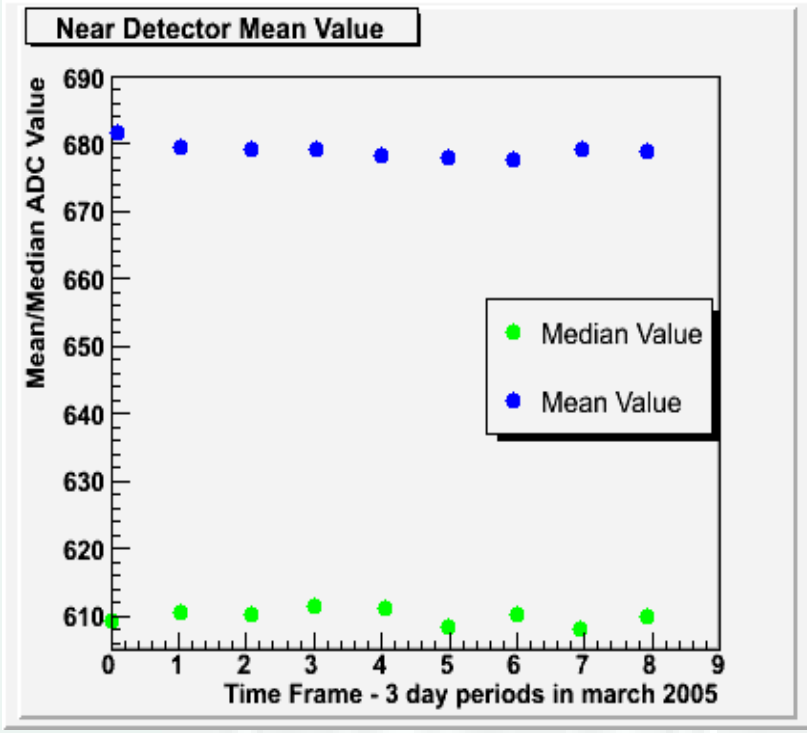
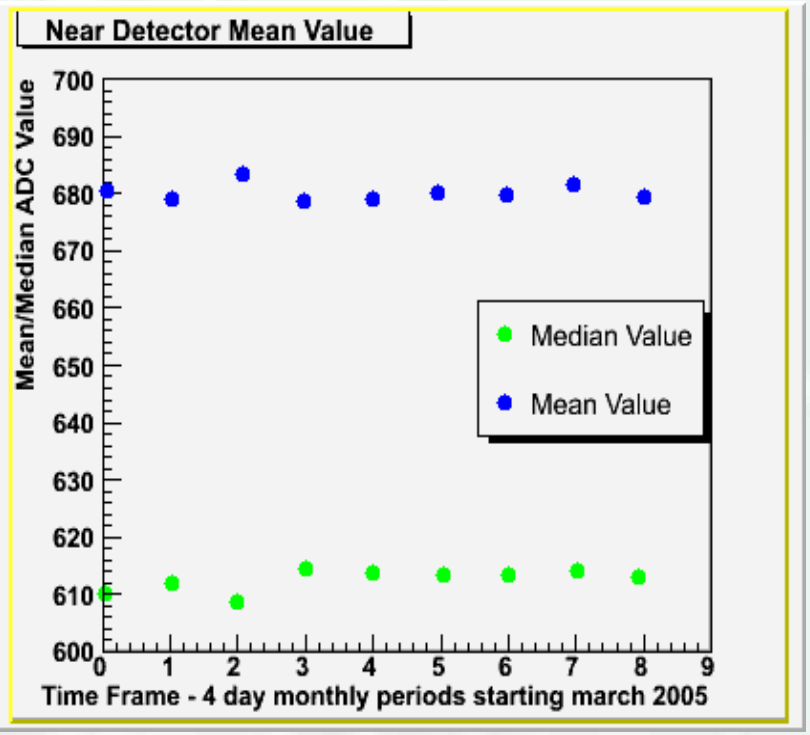
3 day periods, March 2005



4 day(monthly)- March-Nov 2005



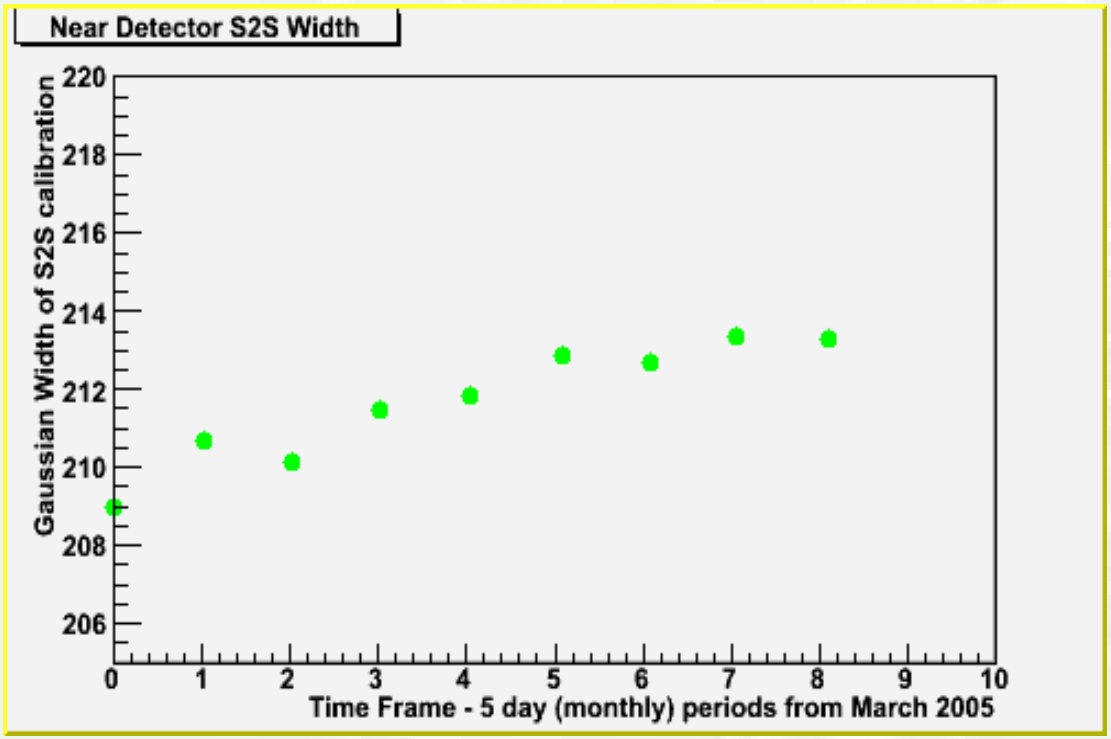
To Note:

- Justin showed variation due to temperature, I see this as well
- There is no noticeable effect over the period March-Nov 2005

I've also analyzed march/april 2005 completely in 3 day increments.

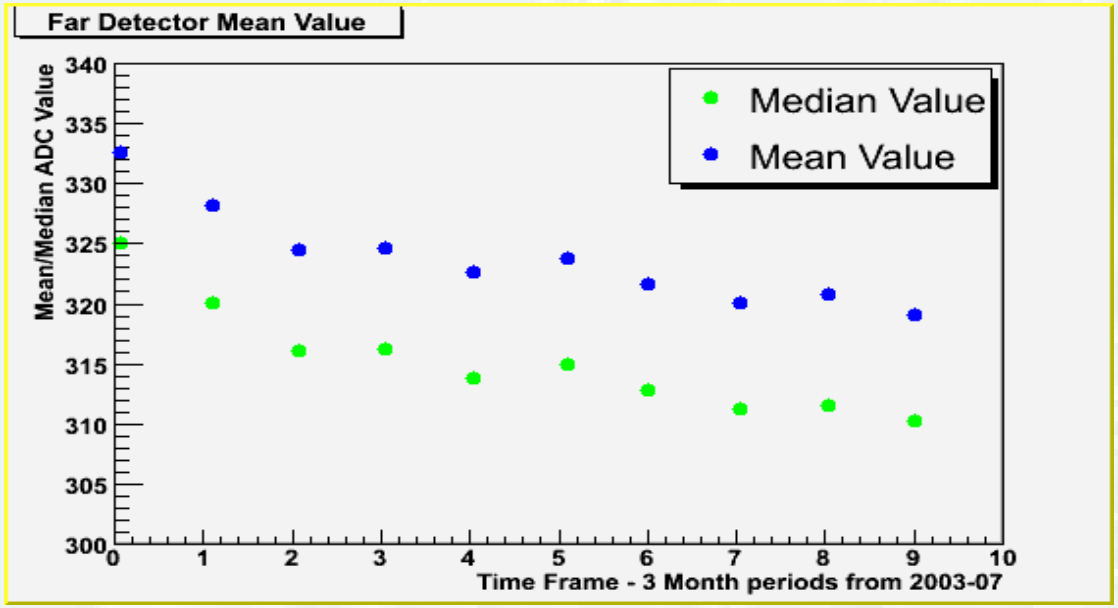
Near Detector S2S constant width

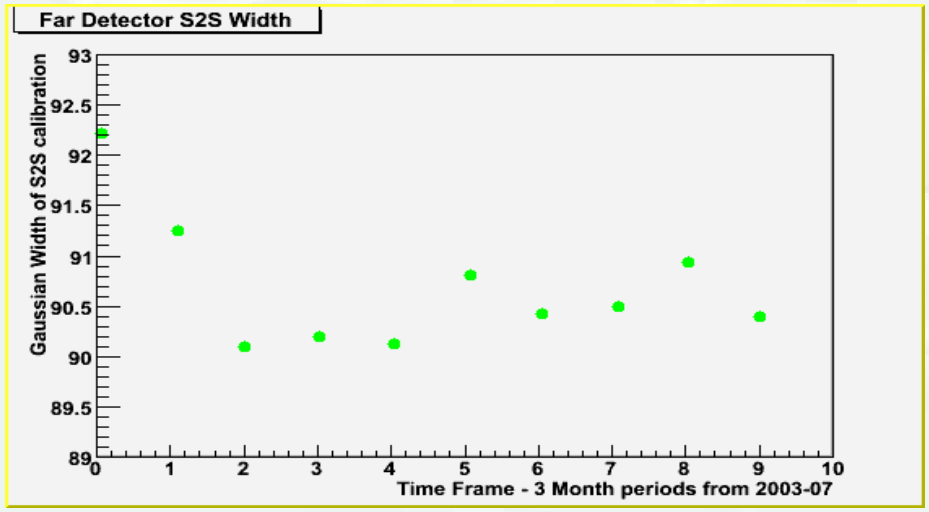
Plotting a histogram that contains the Mean ADC value for all strips gives a gaussian → the width of this gaussian changes!



- Width has been determined using a 4 day period containing roughly 2.1million snarls

Far Detector S2S Status





- Consistent decrease in ADC output as a function of time.
- Using 3 month periods I have completely analyzed the data set July 2003 to December 2005.
- Currently looking into MySQL/database writing.
- There is some indication that the width of the S2S constants may increase with time.

(roughly 3.5 million snarls)

The Next Iteration

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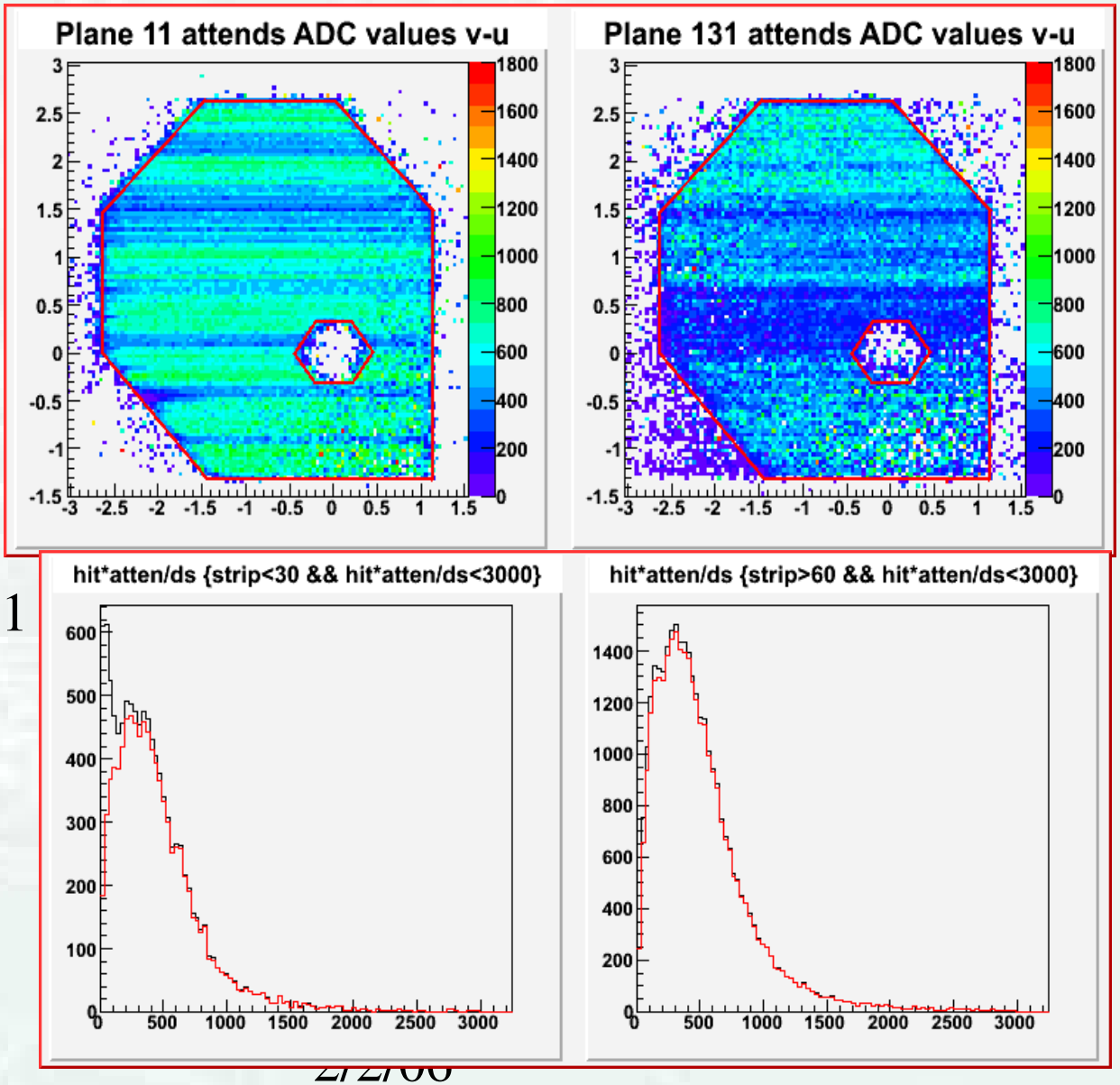
- The S2S algorithm includes hits that occur outside the detector !!. BAD

- This is quite prevalent in the spectrometer.

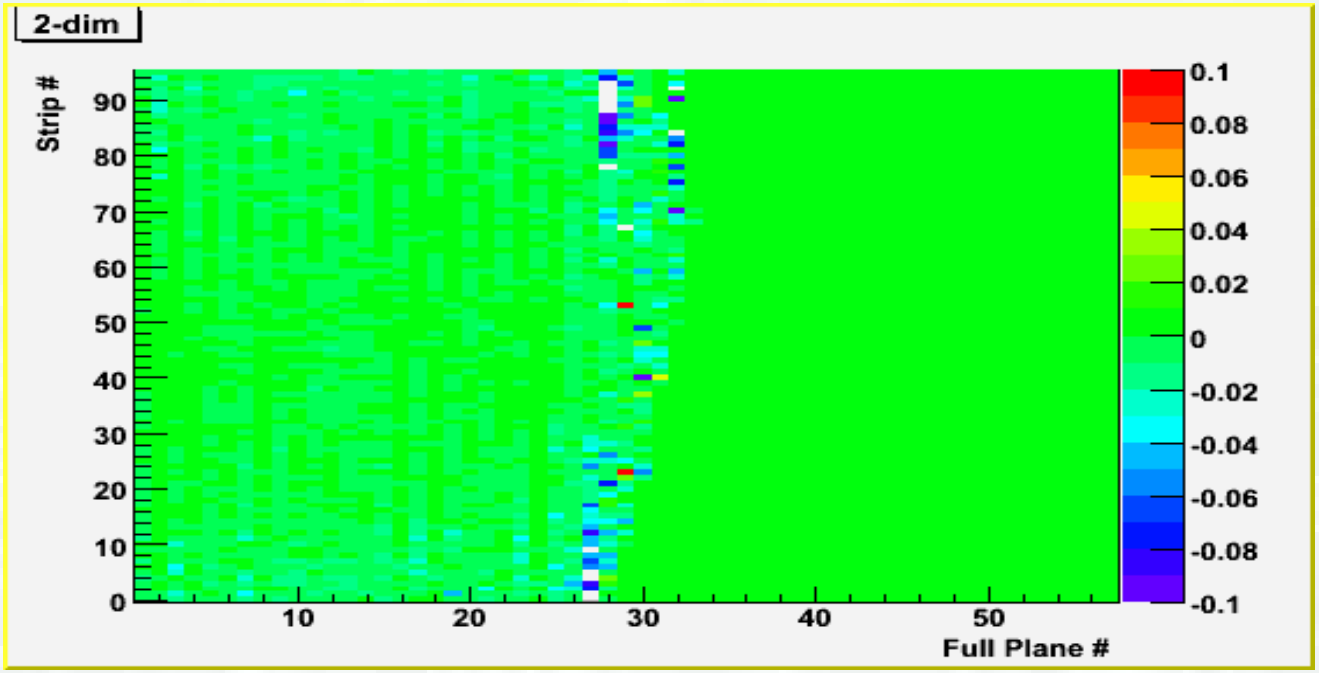


Spectrum of plane 131

Only good hits

all hits

This does have a significant effect on the strip to strip calibration numbers.



Scale of Changes:

Plane #s	Veto 0-20	Target 21-60	Hadron Shower 61-120	Spectrometer 121-281
# good hits	1407	2812	4221	616
> 1% dev.	28	58	89	231
>2 %	10	5	12	136
>5%	0	0	0	47
>10%	0	0	0	17
>20%	0		0	2