LI at the Far Detector

MINOS Collaboration Meeting

January 2002

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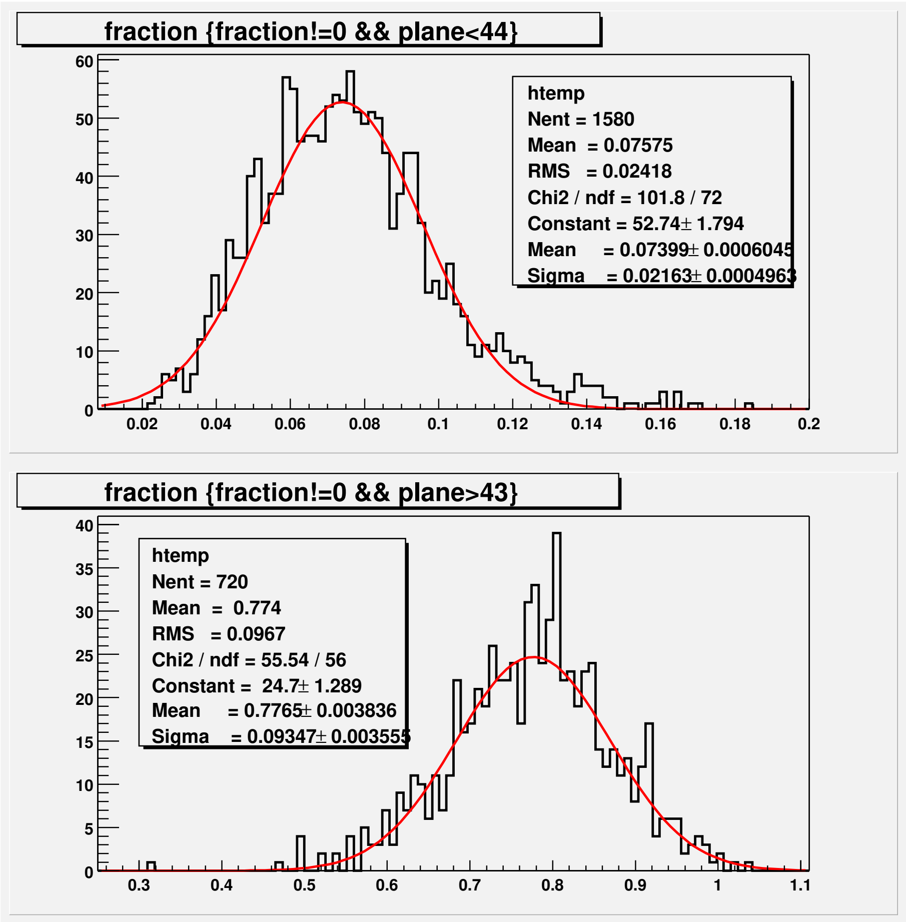
Installation Issues

Hardware:

- Fibre Bundle transmissions improved after installation of step dowels => Fibre Bundle testing at Soudan will be phased out



- One pulser box fully installed (64 planes,trigger and pins)

- Pulser box communication is via EDAS connection on RPS units - known to cause spurious triggers

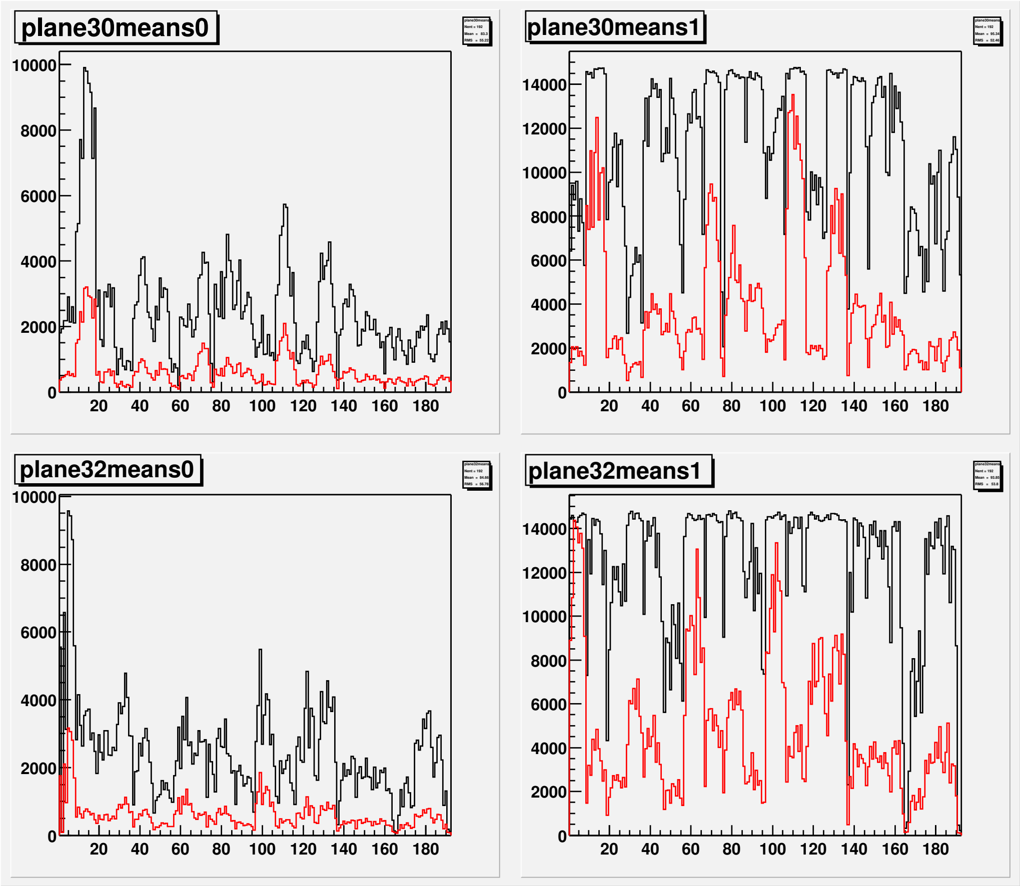
Data Taking

Data Taken

- Currently all data taking has happened in the context of “4-plane checkout” i.e. only have data for planes 29-32 so far
- High rates at Soudan have made it difficult to take data for many more planes before implementation of VARC trigger
- With pulser box flashing at 50Hz, 100 flashes per light level, data was taken for each strip in the 4 planes at 10 different light levels
- No data yet available for PIN diodes

Typical Light Levels

Look at a high (black) and low (red) light level pulser setting for each strip: (Only looking at planes 30 and 32 - for 29 and 31 there were electronics problems)



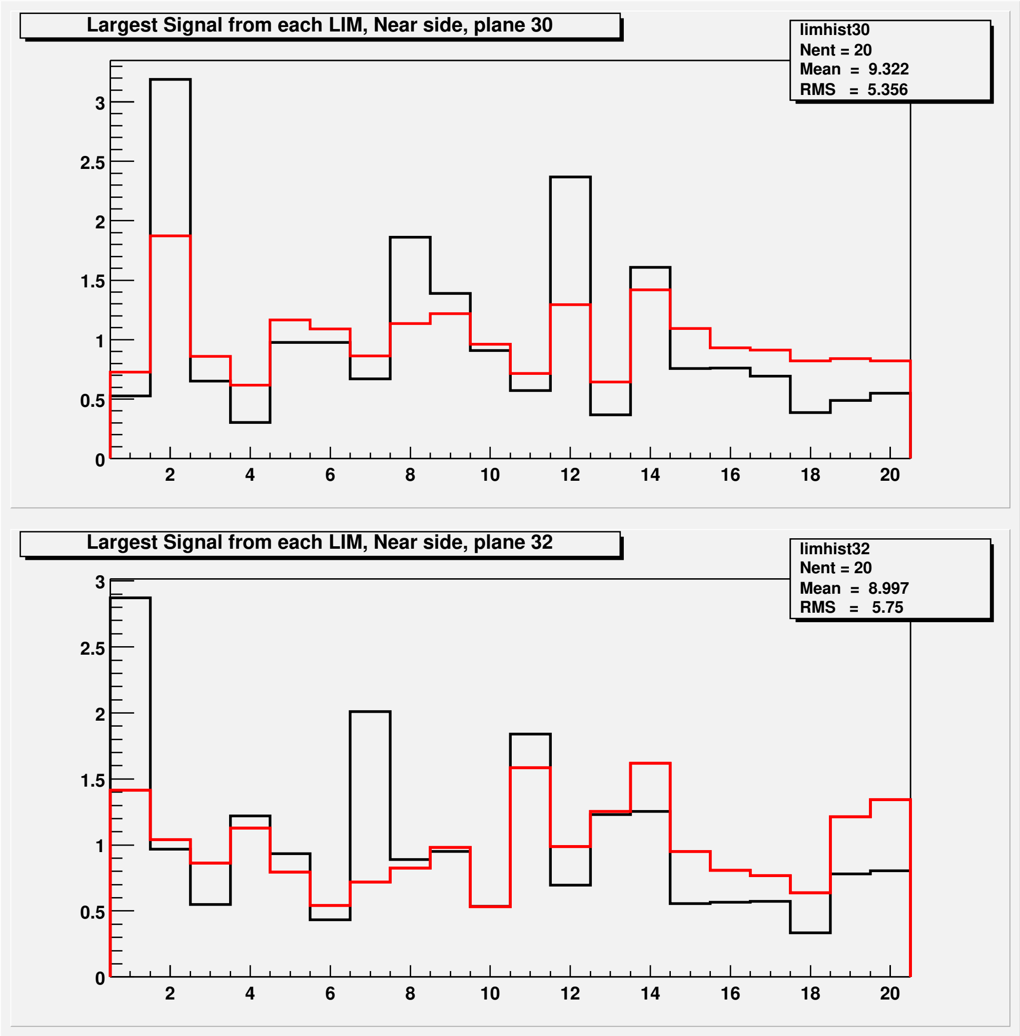
For many of the strips, the full dynamic range of the ADCs can be reached. For some of the strips with lower light levels, an LED may need to be replaced

Typical Light Levels

Comparison with test data:

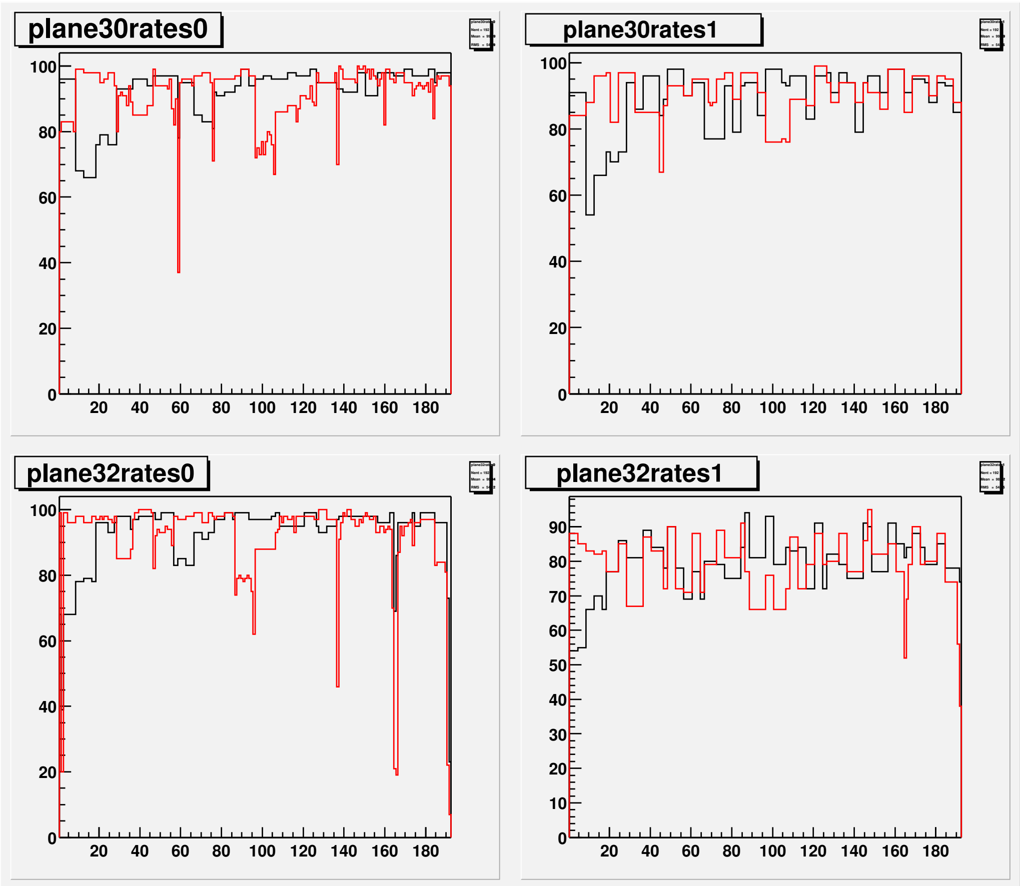
At a lower light level (before any strips saturate), find the strip with the highest response for each LIM (LED)

Compare variation in strip response with known LED variation:



Rates

Can also look at number of hits for each strip (expect 100 hits):



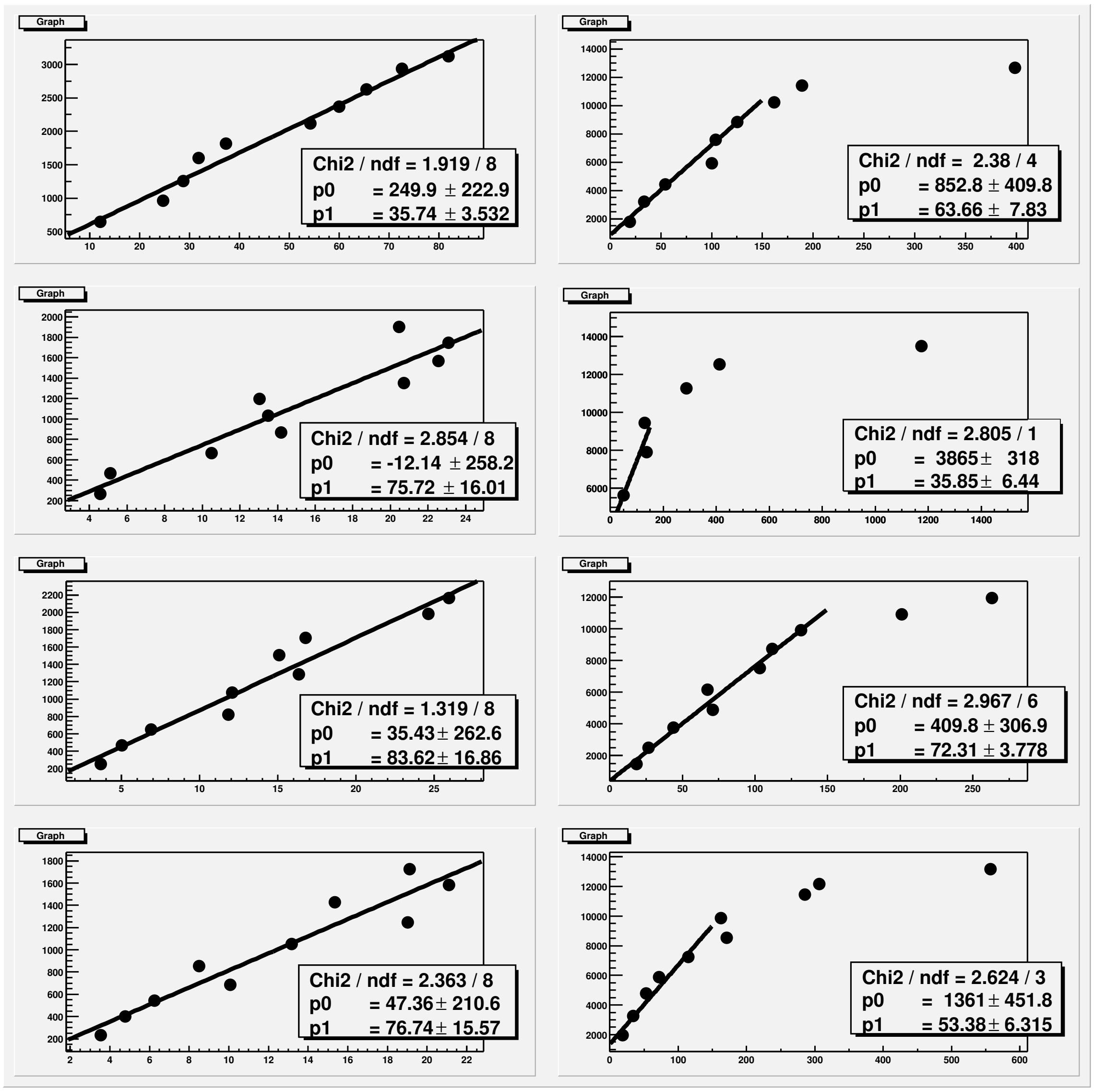
Can see that for some of the crate 1 readout channels, only ∼80% of the expected hits are seen.

This is likely to be a consequence of the RPS unit, (spurious trigger increase chip deadtime).

Gain Curves

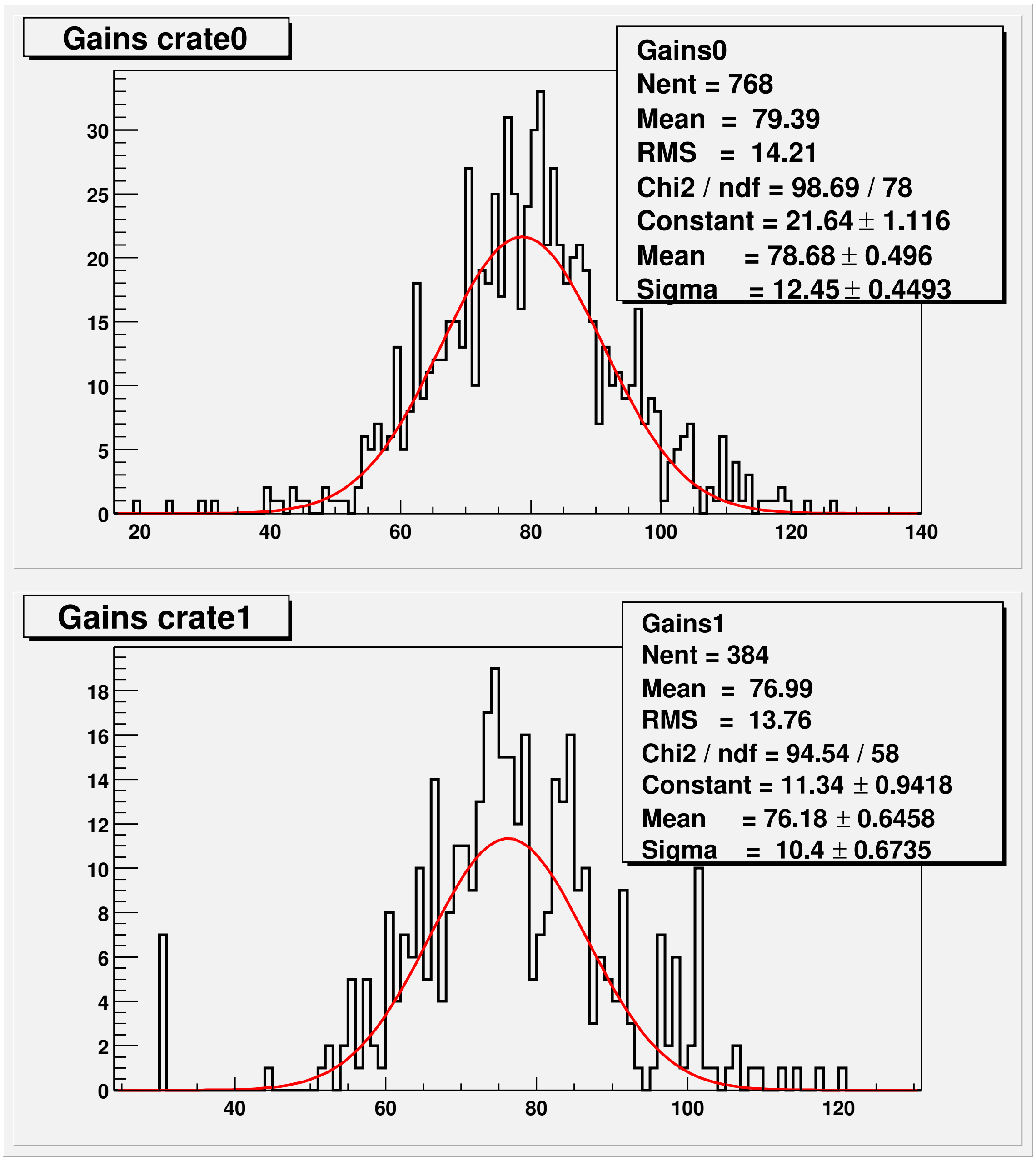
Make gain curves for all strips both ends, and do linear fit:

Examples:



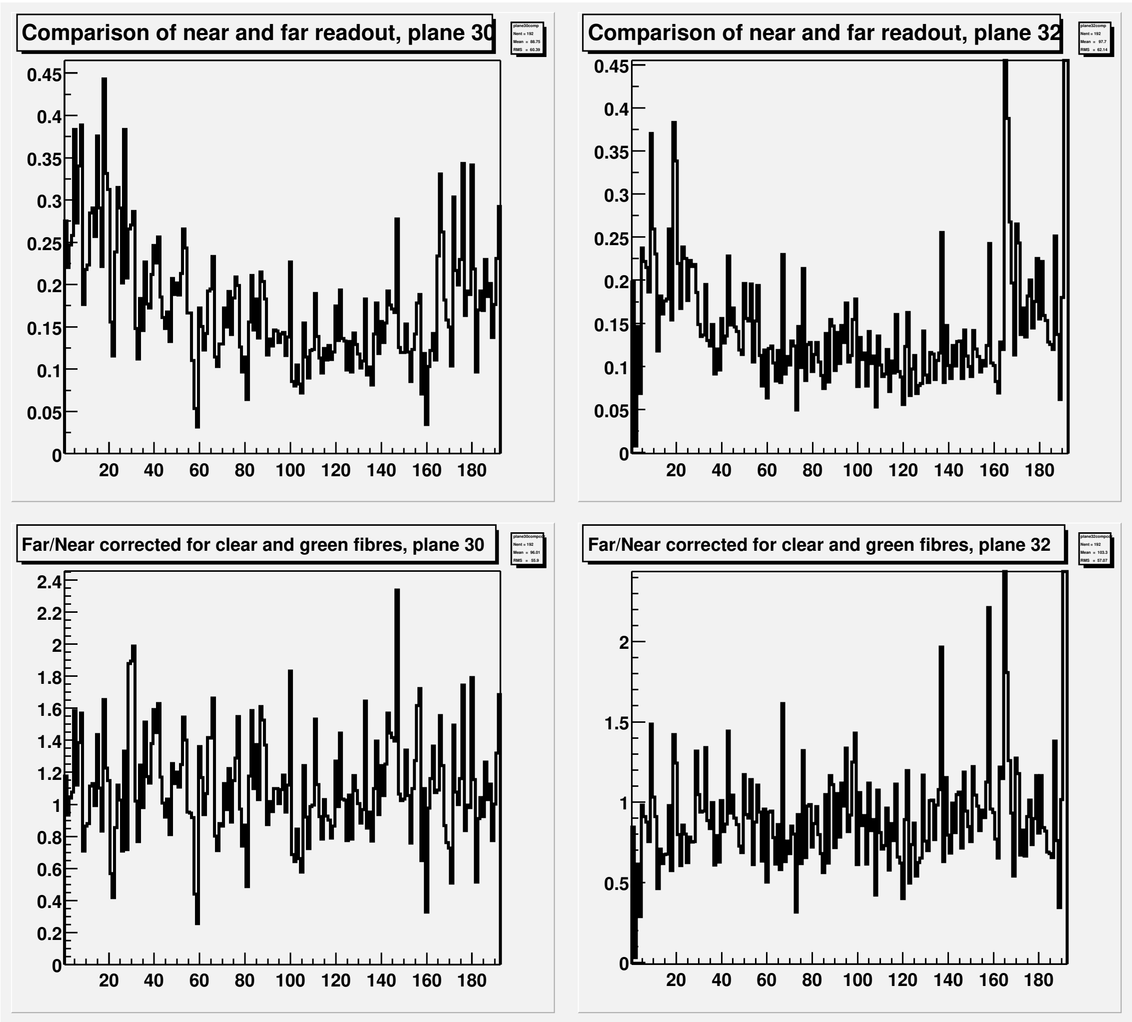
Gain Curves

From fitting gain curves:



Near/Far Readout Comparison

Look at Ratio Near/Far as a function of strip at a low light level:

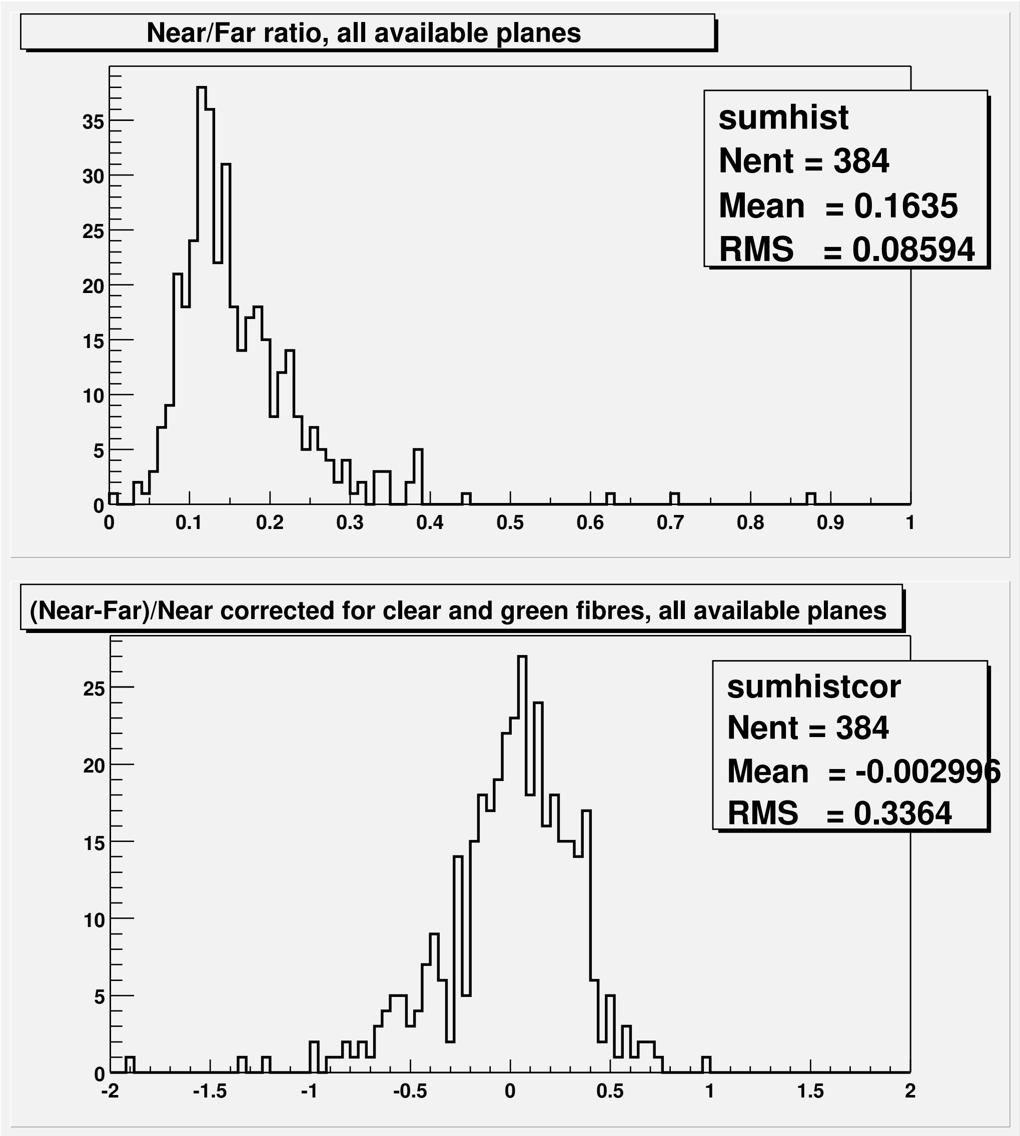


Upper plots are before any corrections are made - the shape of the detector is visible

Lower plots are after corrections for attenuation in green and clear fibres have been made.

Attenuation Lengths Used: Green: 4.5m ; Clear: 10m

Near/Far Readout Comparison



Upper plot => Near/Far ≈ 16%

Lower plot: fractional difference between corrected values

mean ≈ 0 as expected