Light Injection Installation at Soudan

Installation Workshop

October 2001

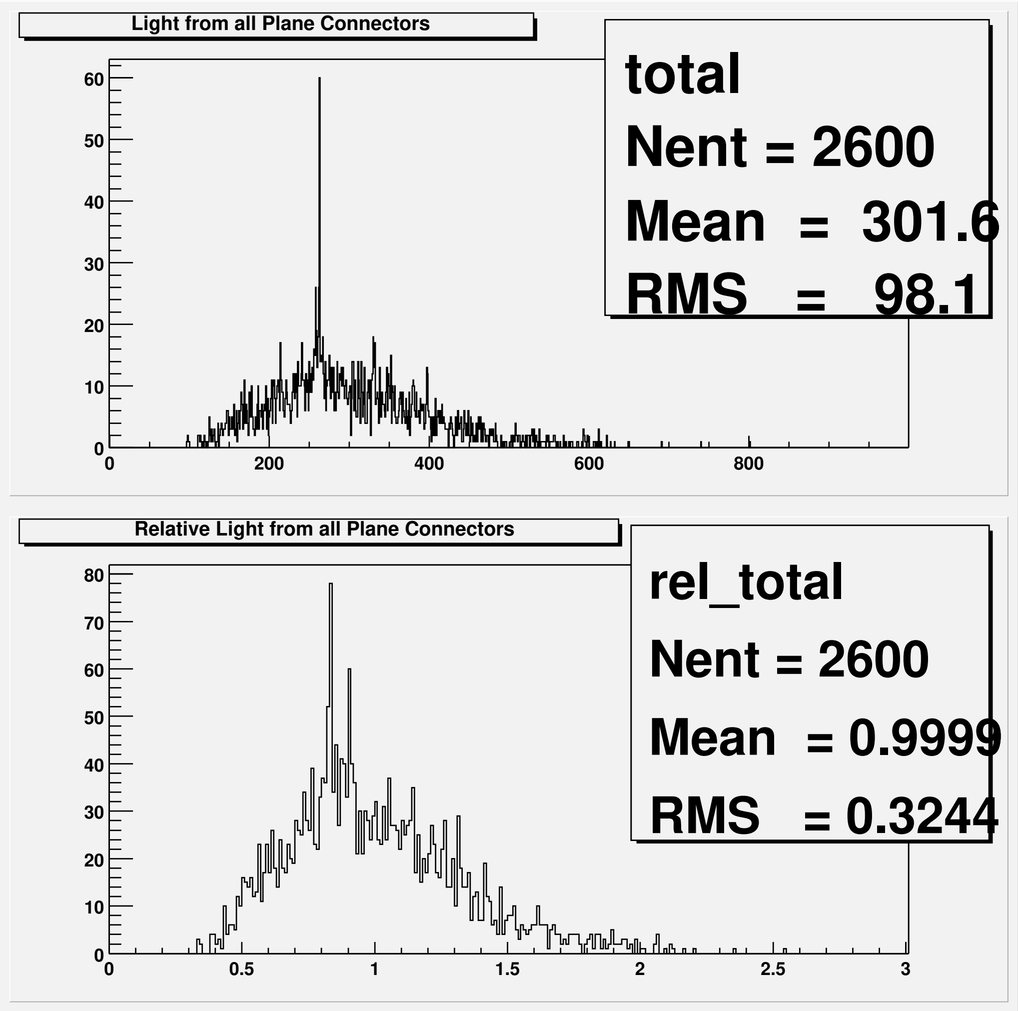
Current Status:

- 2 pulser boxes installed and tested - one tested with grease, one without
- Fibres for planes 1-29 delivered and tested, (except planes 5-7)
- Fibres 5-29 installed to planes, 5-20 connected to pulser box on west side
- Planes 1-4 need to be retro-fitted. Time Consuming!
- Light injection data has been taken for planes 5-20 using brightest pulser settings. Light Levels are low at PMTs.
- PIN and Trigger cables not yet installed

Pulser Boxes

Light Output

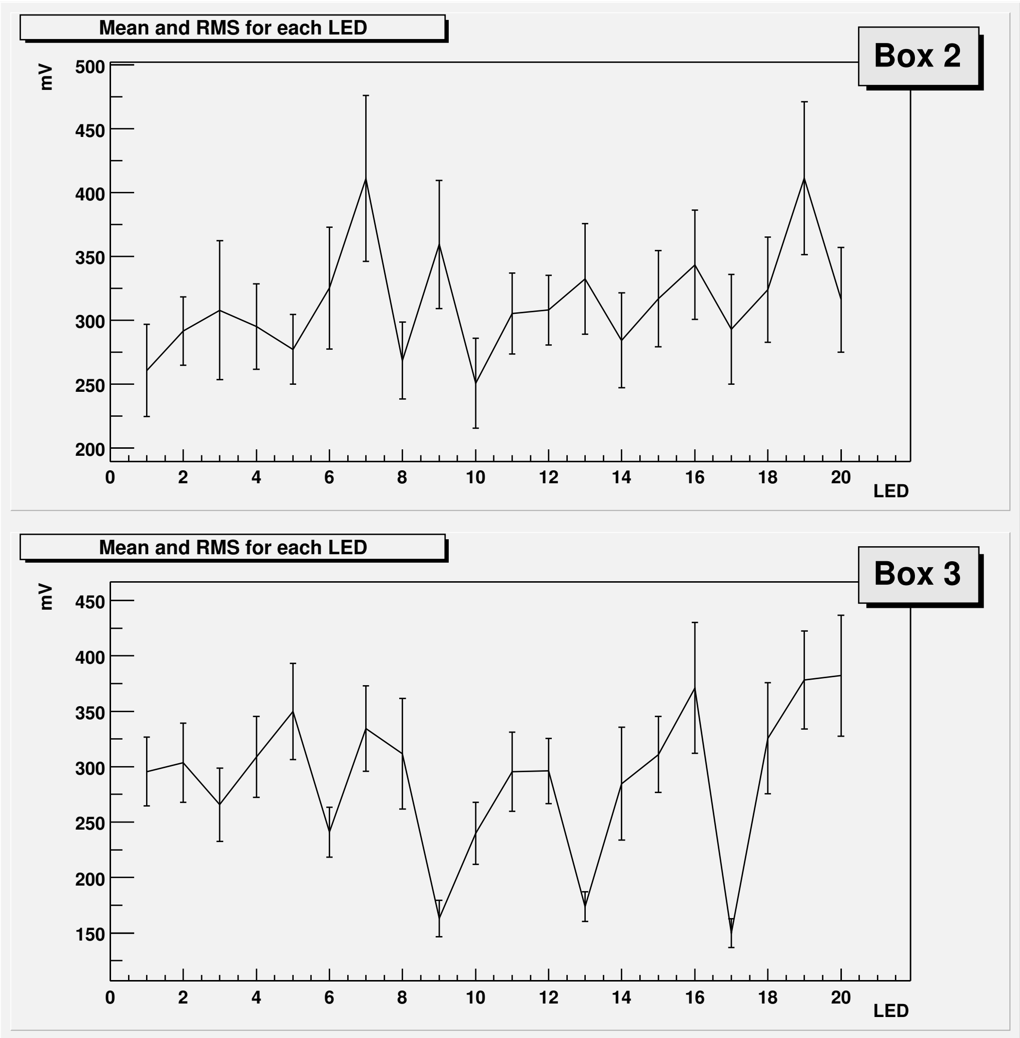
- Pulser boxes tested by measuring light output through a clear, 1m test cable. Light is measured using an array of PINS
- Average light output for all fibres in both boxes is $\sim$302mV $\approx$ 1000pes. (1mV = 3-4pes)
- Variation in light output over all fibres in both boxes is $\sim$32%



Pulser Boxes

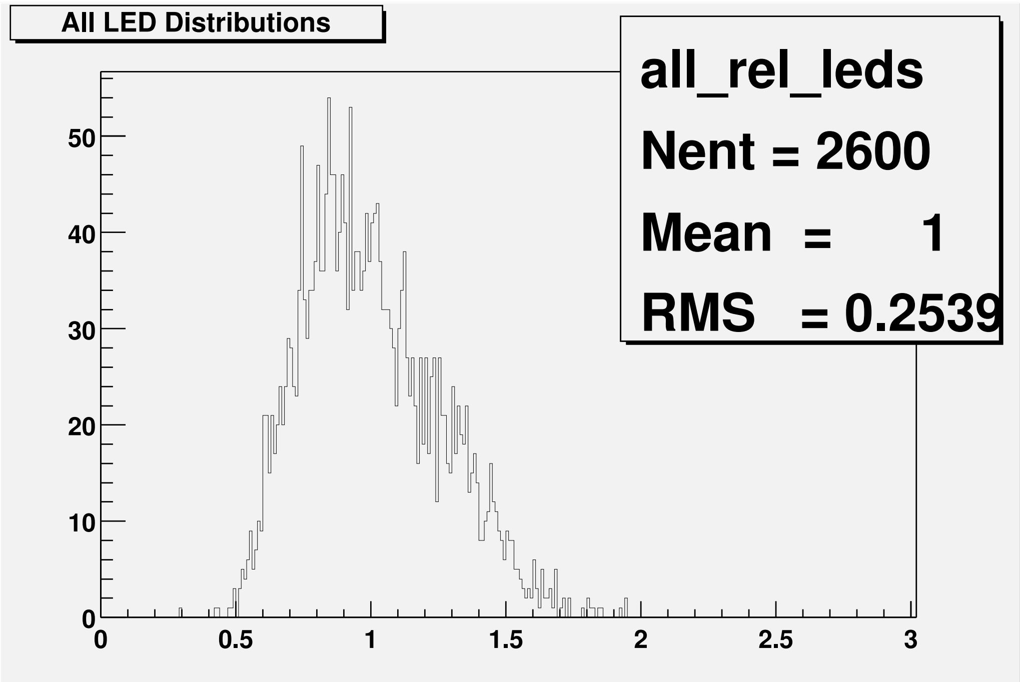
Comparing Different LEDs

Taking the Mean and RMS from separate histograms for each LED for each box:



Pulser Boxes

Now, look at variation in light going to each plane:

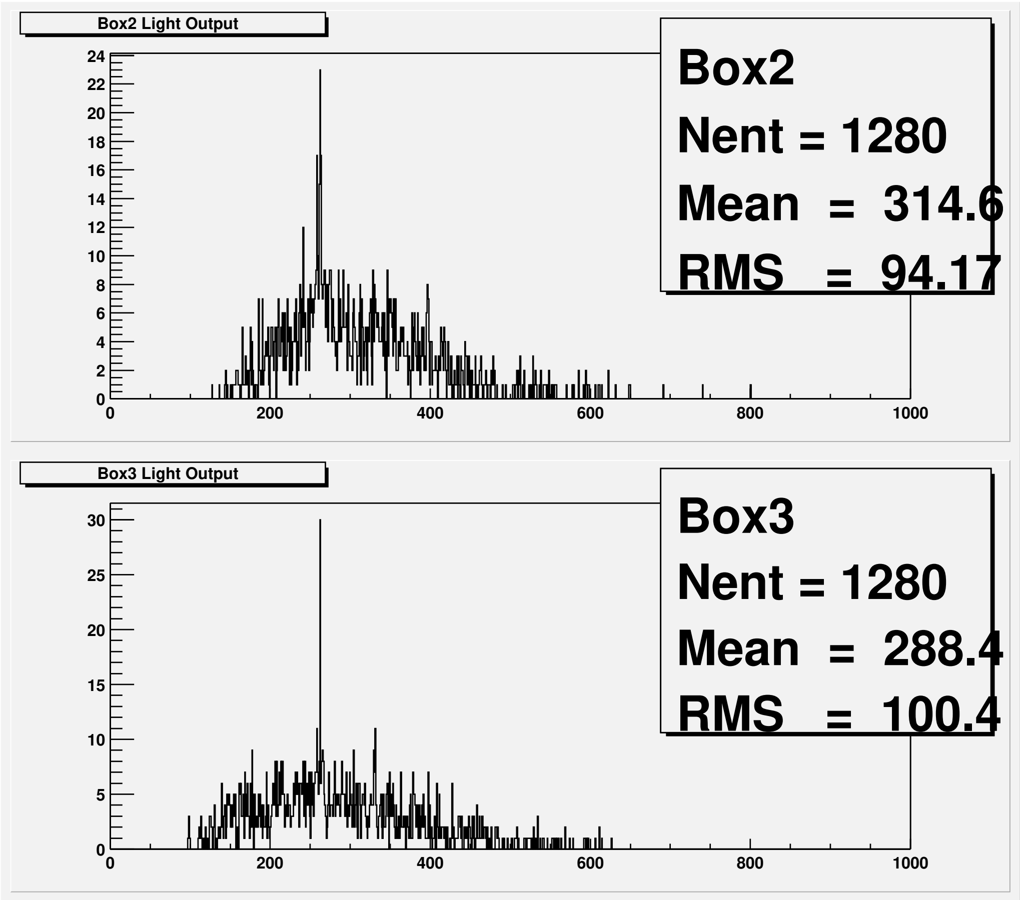


i.e. within a single connector the typical variation in light is ∼25%

Pulser Boxes

Comparison of Boxes

Box 2 was tested without grease, Box 3 was tested with grease.

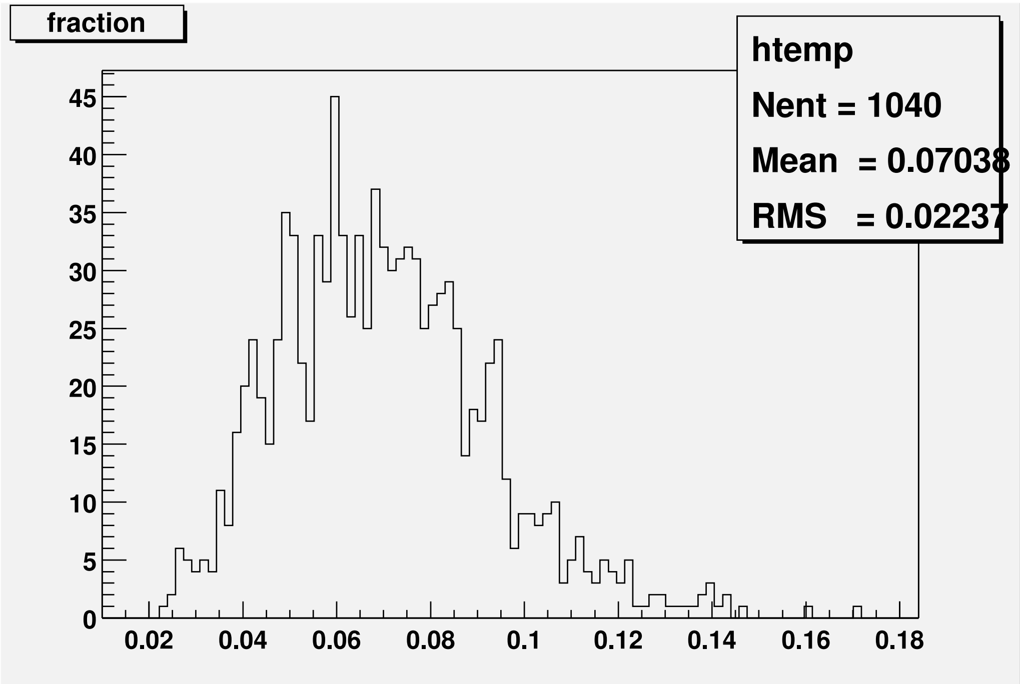


Fibres

Fibre Tests

Fibres are tested using the same setup as for pulser boxes. One of the PIN connectors on pulser box is used for testing (light level is higher). Fraction of light transmitted is given compared to 1m length.

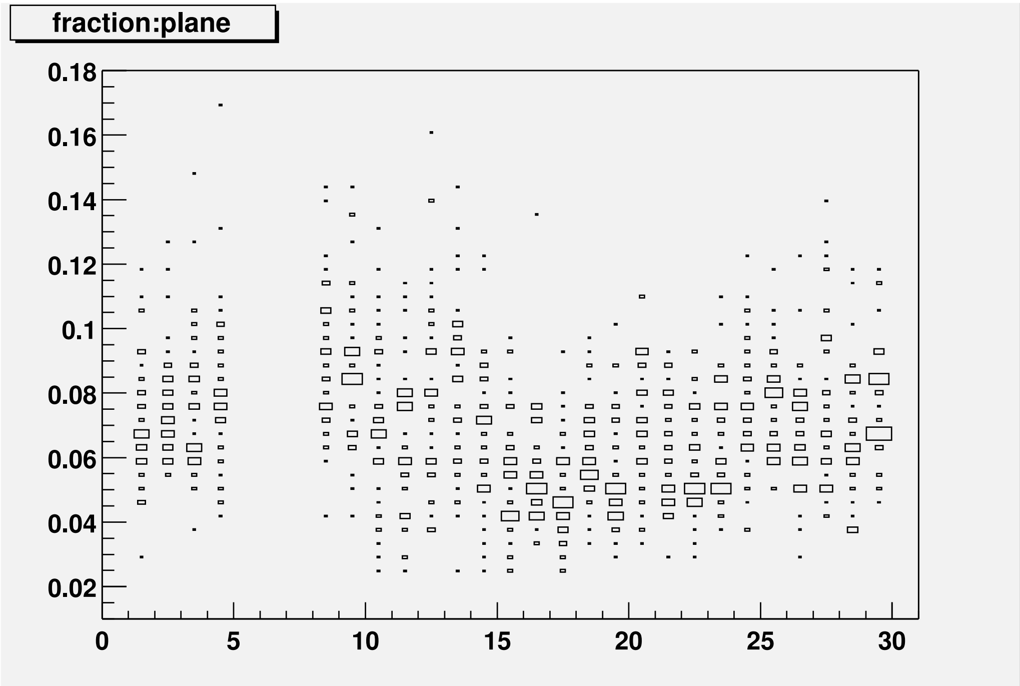
Fractional Light Output from All Fibres:



Light Transmission on average is therefore $\sim$7%

Fibres

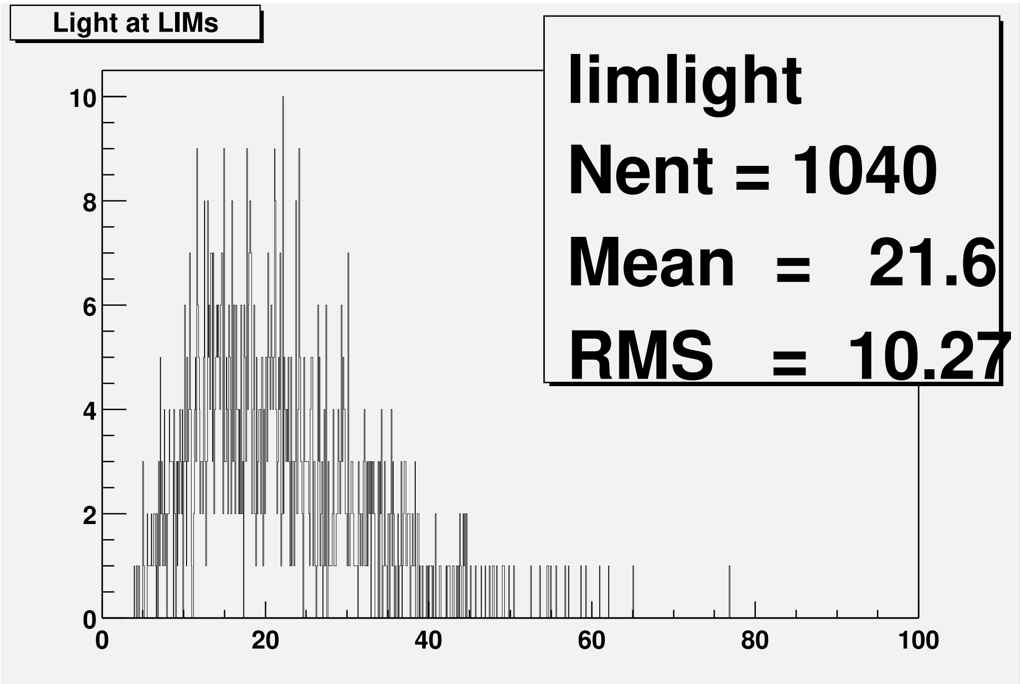
Fractional light output from all fibres as a function of plane:



Descrepancy at plane 14 corresponds to a new delivery of fibres from OMC.

Light at LIMs

Using the information collected from pulser box and fibre testing, the amount of light reaching LIMs can be estimated:



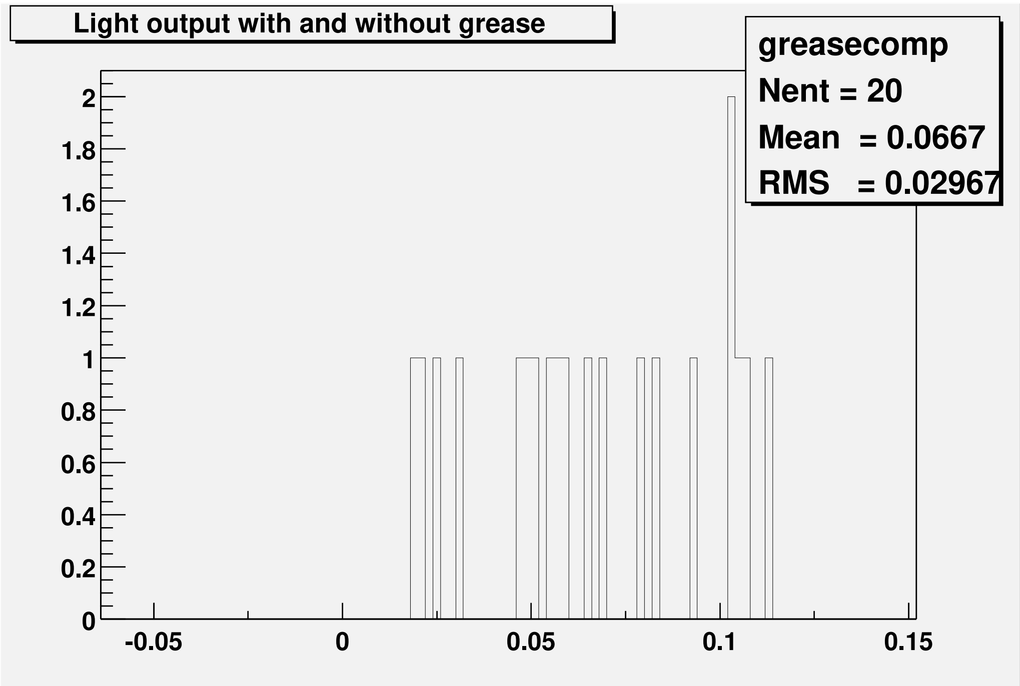
Thus 22mV get to LIMs

Summary

- Average light output from pulser boxes $\approx$ 1000pes
- Average transmission of fibres $\approx$ 7%

Grease/No Grease Comparison

Only have one set of data from testing one fibre. Look at relative difference between 20 values:



With grease values are ∼7% higher than without.