

AD3 PMT Gains and Dark Rates Time Variation

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- 1) Script: RollingGain/PmtCalib.py
- 2) trunk revision 10308
- 3) run 7000 and 7005 for AD#3 test run were calibrated.
- 4) Two extra cuts were applied to remove 40MHz noise and noise associated with Esum trigger
- 5) Right now the result is stored at on-site farm:
 - ~/NuWa-trunk-dbg/NuWa-trunk/dybgaudi/Calibration/RollingGain/aileron/
 - 0007000-0007005/Rolling01/AdcFit.root has all the fitting result
- 6) I randomly picked two fits and attached at the end.

Channel by channel variation: **longRun.pdf**

Global drift: **GainDrift.pdf**

Let's take a few minutes to look through them...

A few observations:

- 1) One channel has very high hit rate: R8C4

Identified as light leak:

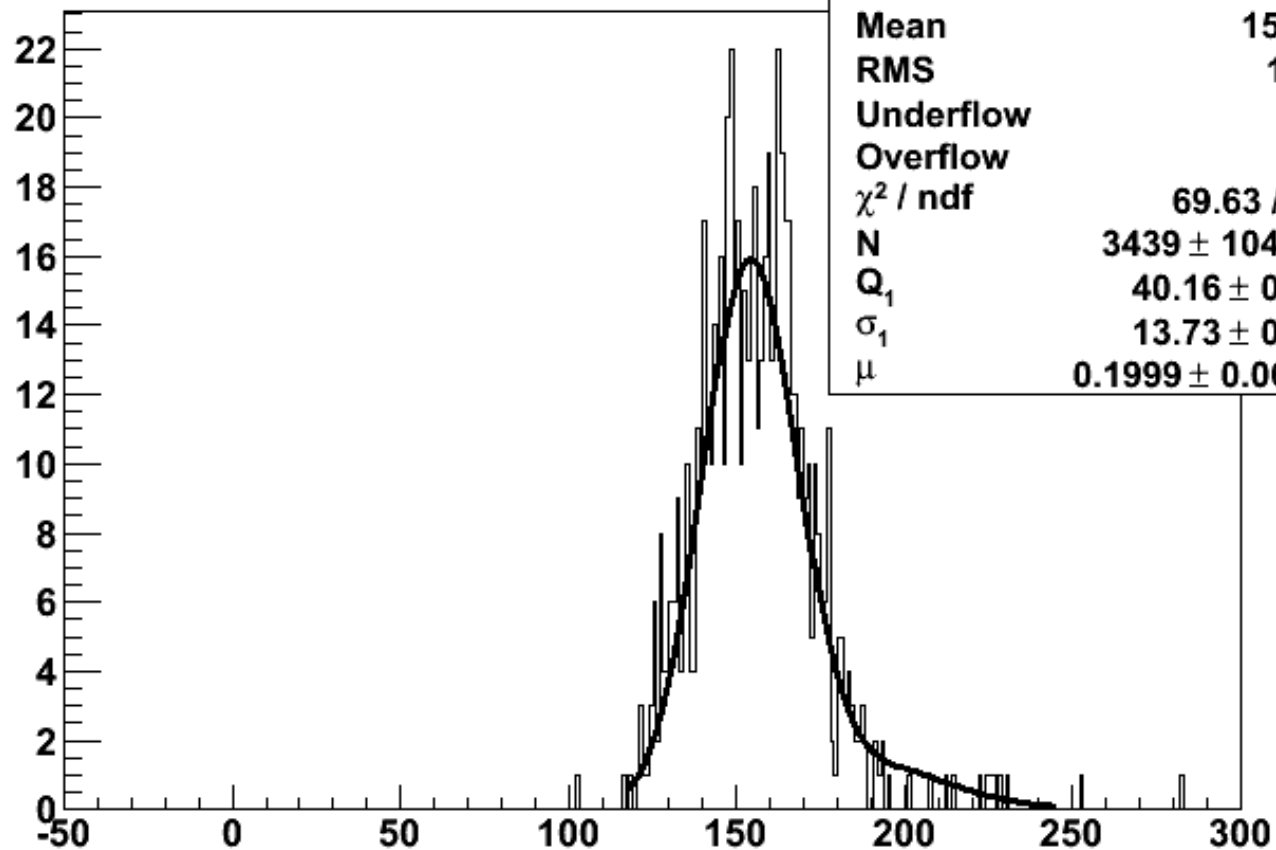
<http://dayabay.ihep.ac.cn:8099/Commissioning/344>

- 2) The jump around 46 hours is caused by low statistic fits after a manual stop.
- 3) R5C17, R4C16 and R4C17 have very consistent pattern of Rate-Time variation.
- 4) Again, there is a 1% decrease of gain over 72 hours.
For AD2 dry run result, see DocDB 5527

An example fit:

Time frame 3: ring 2 column 13

h_Adc_SABAD1_R02_C13



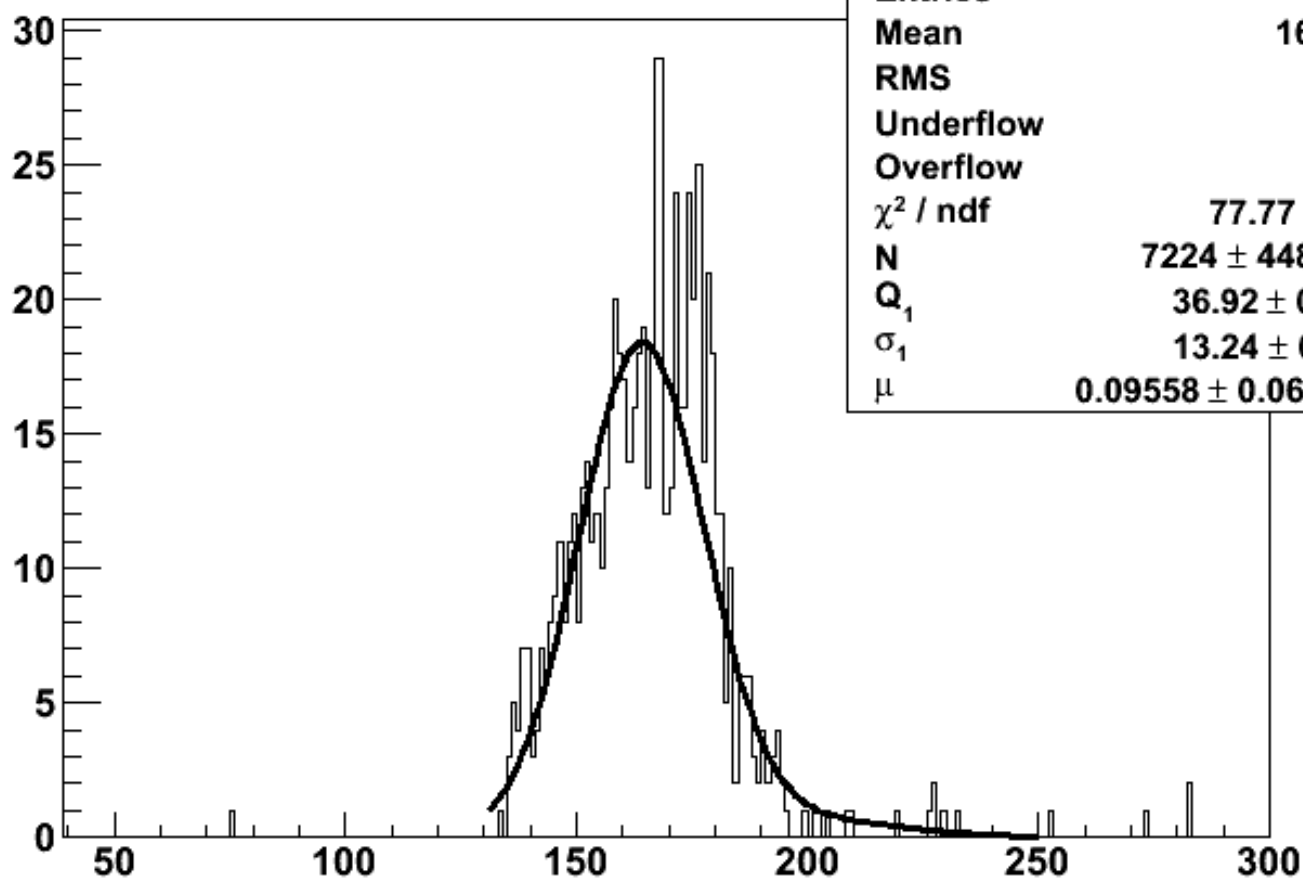
h_Adc_SABAD1_R02_C13

Entries	669
Mean	155.7
RMS	18.1
Underflow	0
Overflow	6
χ^2 / ndf	69.63 / 80
N	3439 ± 1042.5
Q_1	40.16 ± 0.76
σ_1	13.73 ± 0.63
μ	0.1999 ± 0.0696

Another example fit:

Time frame 10: ring 2 column 20

h_Adc_SABAD1_R02_C20



h_Adc_SABAD1_R02_C20

Entries	727
Mean	166.5
RMS	17
Underflow	0
Overflow	13
χ^2 / ndf	77.77 / 69
N	7224 ± 4488.0
Q_1	36.92 ± 0.69
σ_1	13.24 ± 0.61
μ	0.09558 ± 0.06338