



Initial experience with irradiated FE-I4 assemblies

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- Cref too low
- PlsrDAC calibration changes, slope increases, saturation at low values reduced
- RegSpareN != 0
- overwrite of TriggerCnt not reliable
- tuning to 3000e not too hard
- could not really compare noise so far



Samples for April DESY testbeam

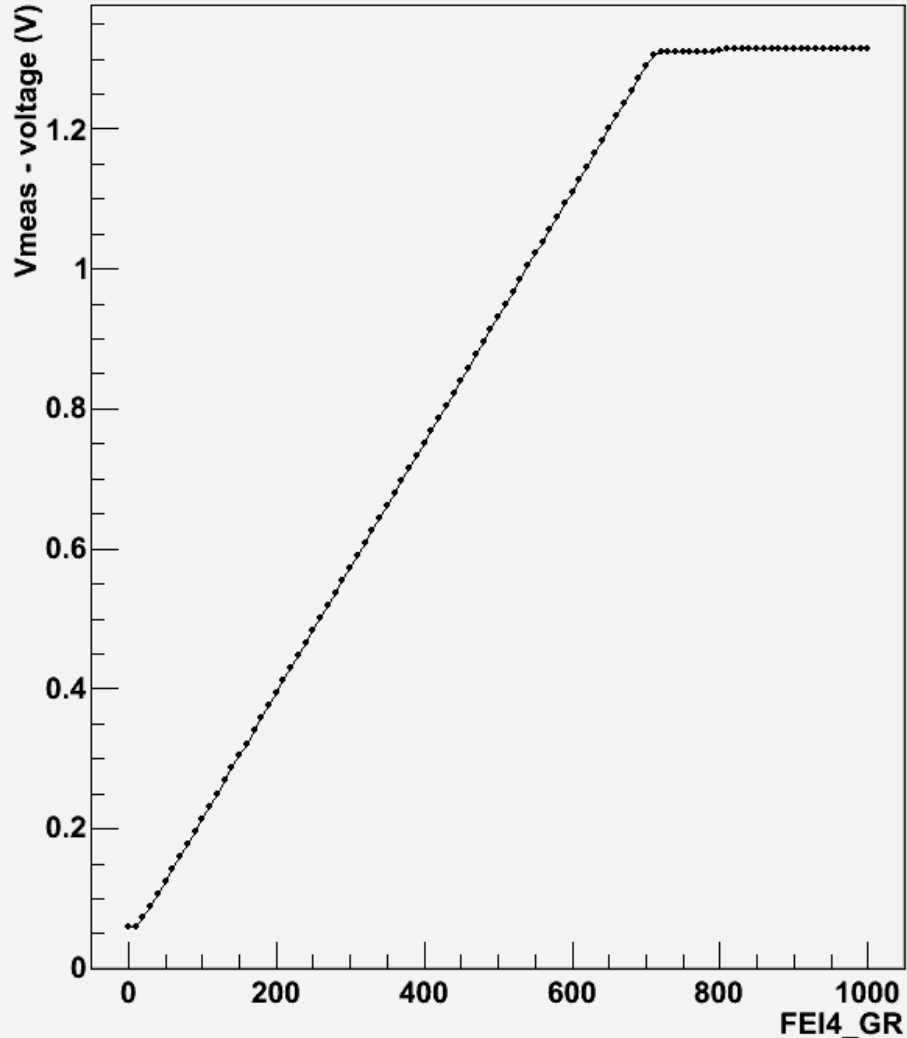
Sample ID	Type	Dose	Comment	Status	Threshold	TOT	Vbias	Available
SCC13	3D FBK	0		data taking finished	3000e ?	10 @ 40ke	-9V	04.04.11
SCC8	PPS, slim edge, 250um	3E+15	Karlsruhe, batch 1	tuned w/o edge columns	3200e	10 @ 40ke	-100V (tuning) -500V (beam)	07.04.11
SCC14	3D FBK	2E+15	Karlsruhe, batch 1	tuned w/ edge columns	3000e	10 @ 40ke	-80V	07.04.11
SCC17	PPS, conservative, 250um	2E+15	Karlsruhe, batch 1	not working				07.04.11
LUB1	PPS, slim edge, 250um (01-06)	5E+15	Ljubljana	high digital current				12.04.11
LUB2	PPS, slim edge, 250um (02-03)	5E+15	Ljubljana	data taking finished	3200e, high dispersion	10 @ 40ke	-1000V	12.04.11
LUB3	PPS, conservative, 250um (05-05)	5E+15	Ljubljana	data taking running	3200e, high dispersion	10 @ 40ke	-1000V	12.04.11
	3D 3E	5E+15	FE-I3, lower priority	no data taken yet				06.04.11



DAC_SCAN_colpr0addr0.

Module "FEI4"

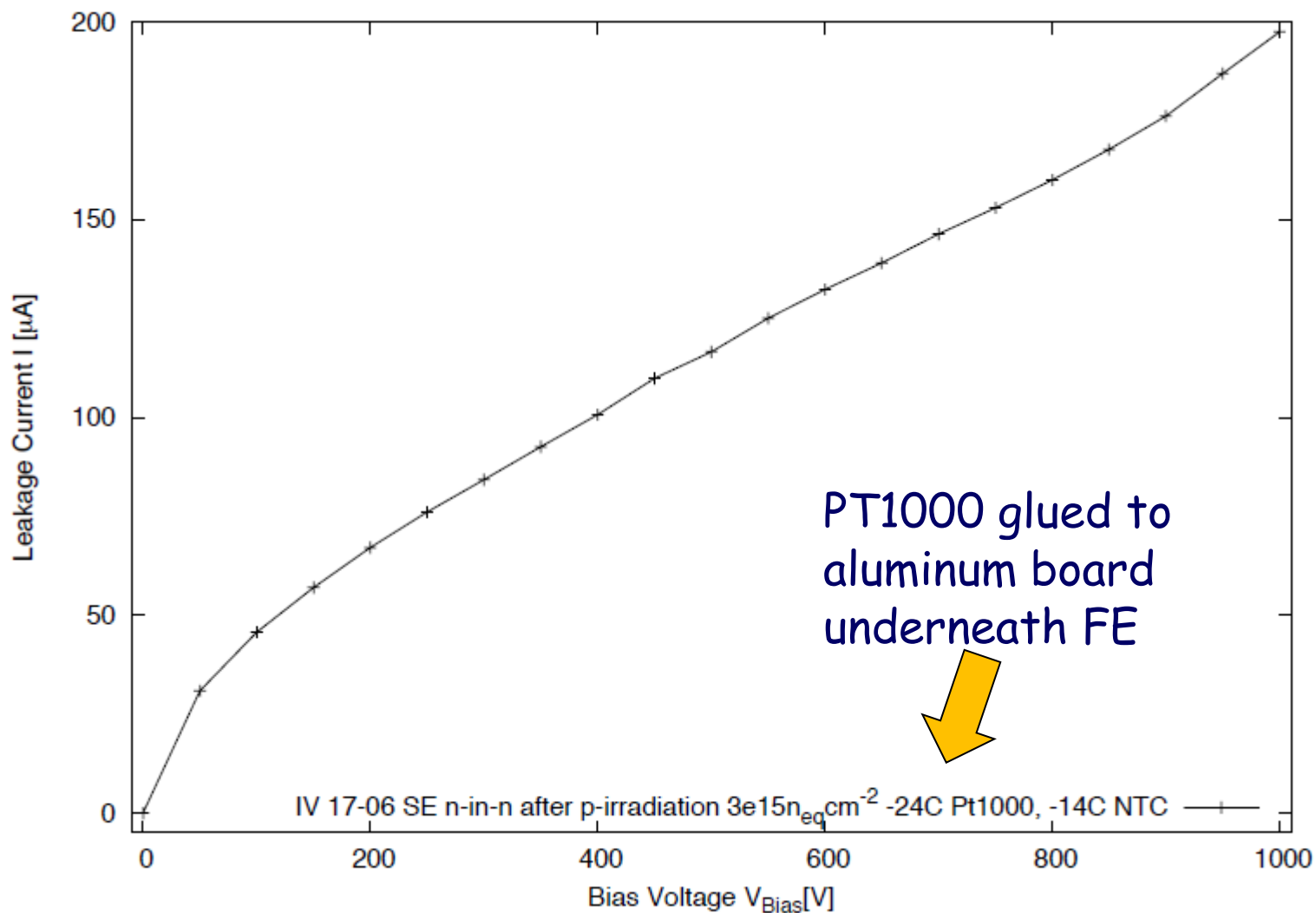
Graph



Saturation of PlsrDAC for low DAC values doesn't occur (measurement taken at room temperature)

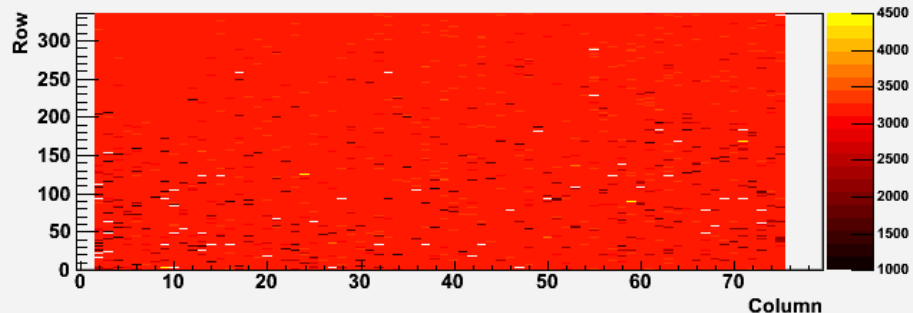
Slope depends on temperature:
1.727 mV/DAC at 20C
1.651 mV/DAC at -5C

→ Repeat calibration when chip is cooled

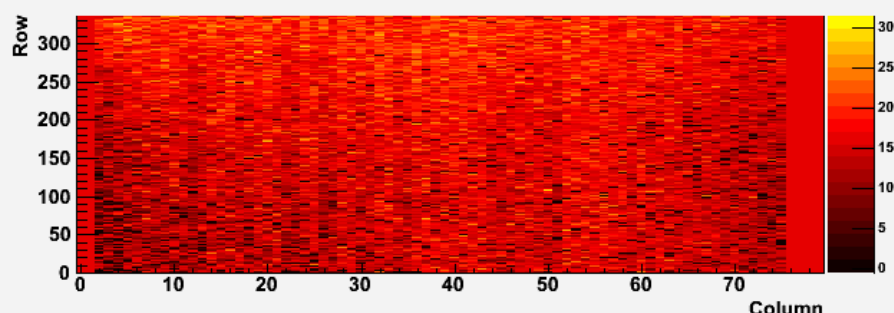


No sign of breakthrough up to 1kV!
Assembly stored in freezer, chip not configured.

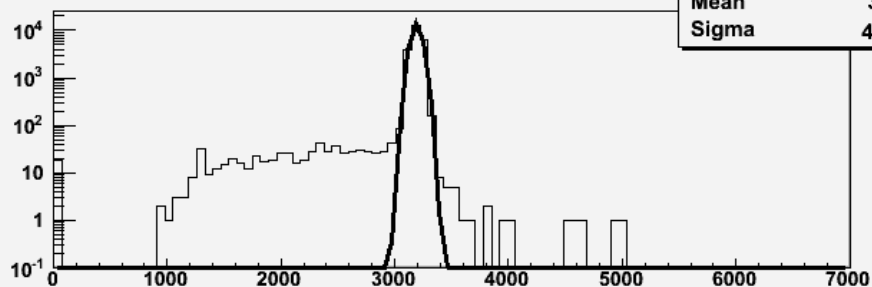
Threshold mod 0 chip 0



Map of TDAC chip 0

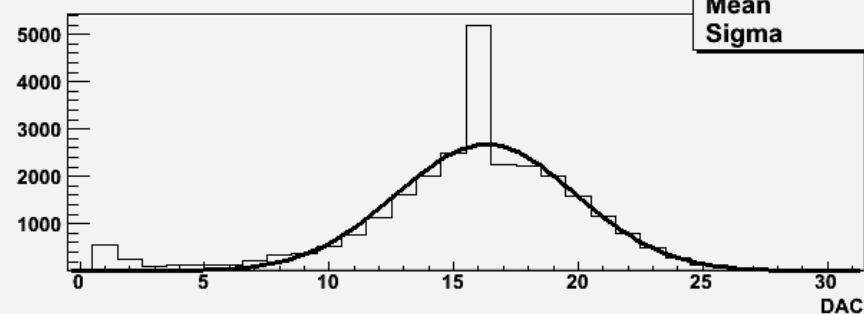


Constant	1.373e+004
Mean	3193
Sigma	47.36

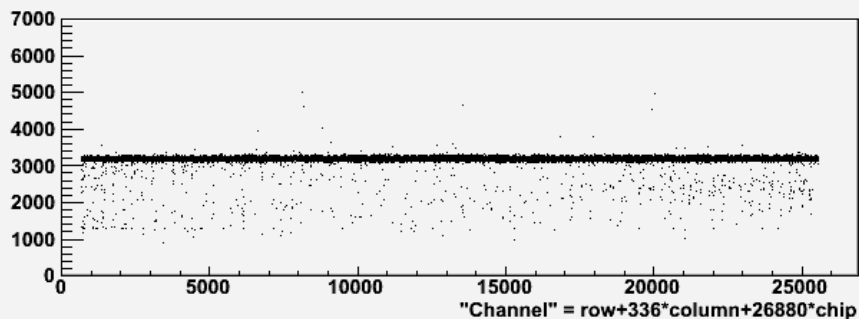
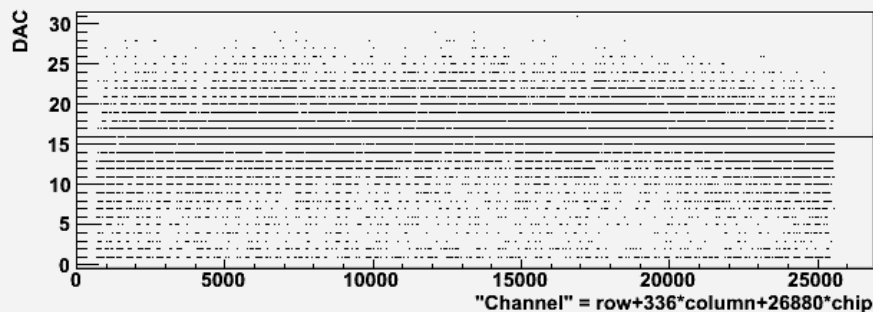


DAC distribution

Constant	2668
Mean	16.31
Sigma	3.617



DAC scatter plot

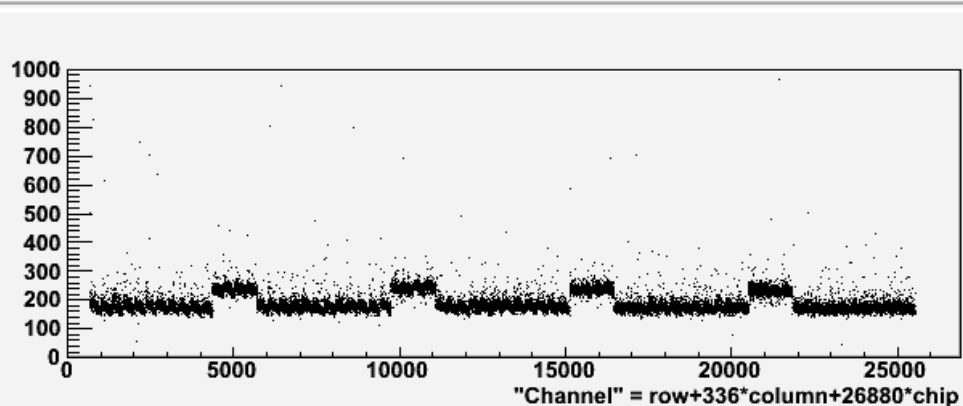
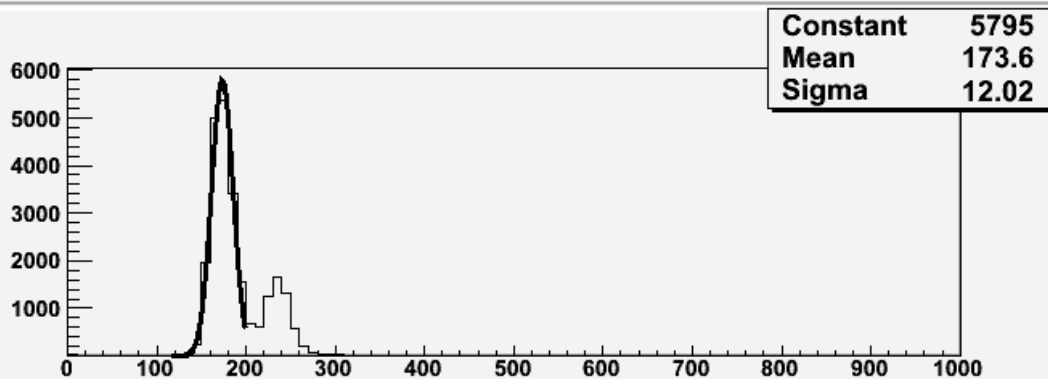
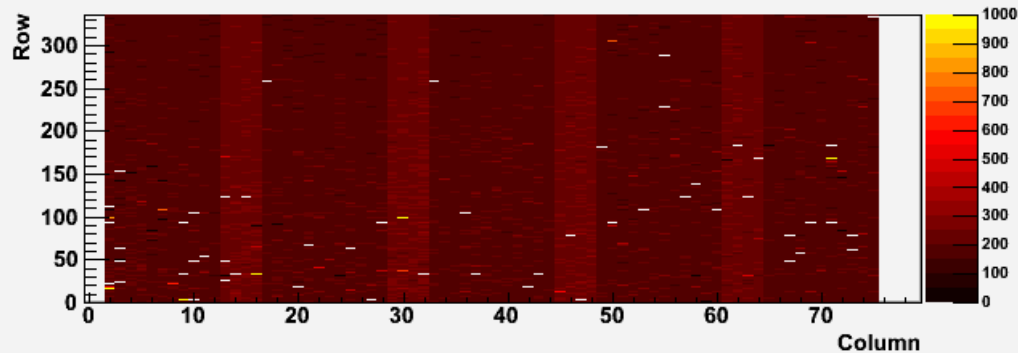


Threshold tuned to 3200e, dispersion is ok.
Edge columns not tuned to keep tuning easy

SCURVE_SIGMA: THRESHOLD_SCAN tuned - Clow.

Module "FEI4"

Noise mod 0 chip 0



No significant increase in noise observed wrt unirradiated samples.

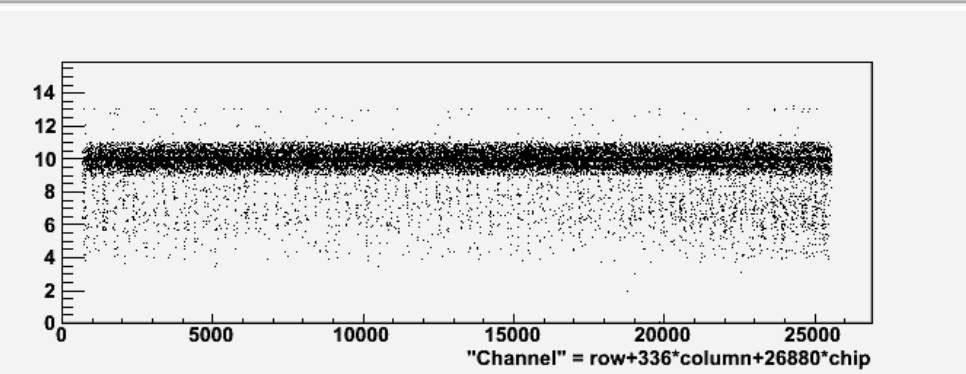
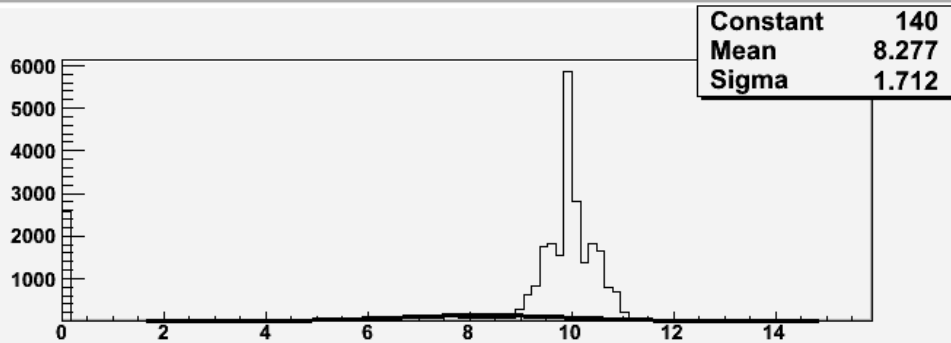
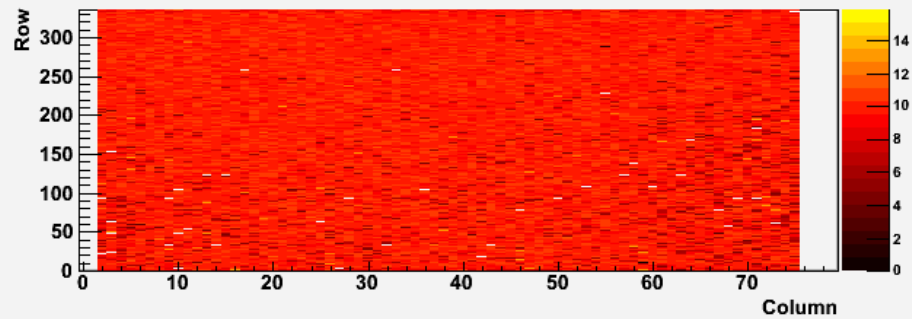
Band structure to be investigated. It seems more pronounced than in unirrad. samples.



TOT_MEAN: tot_verif.

Module "FEI4"

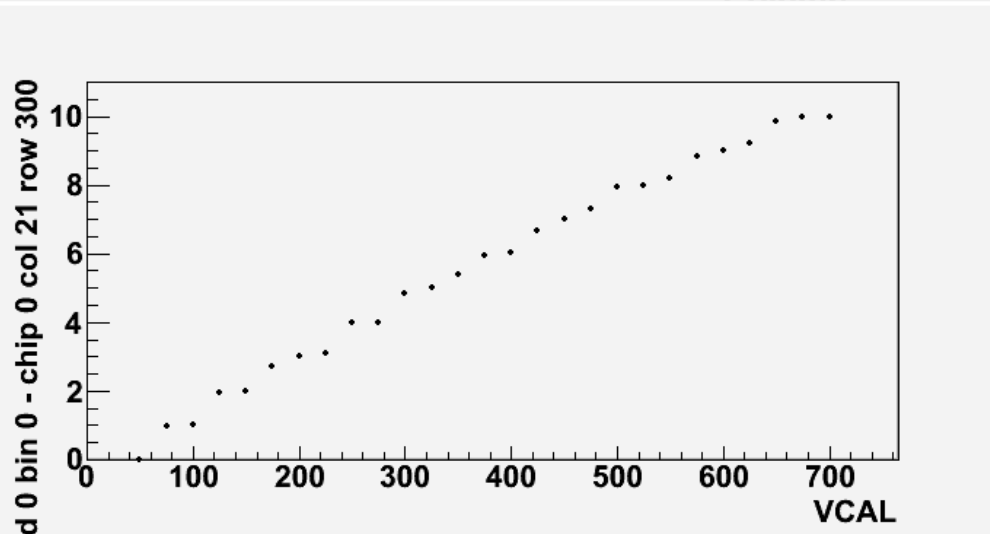
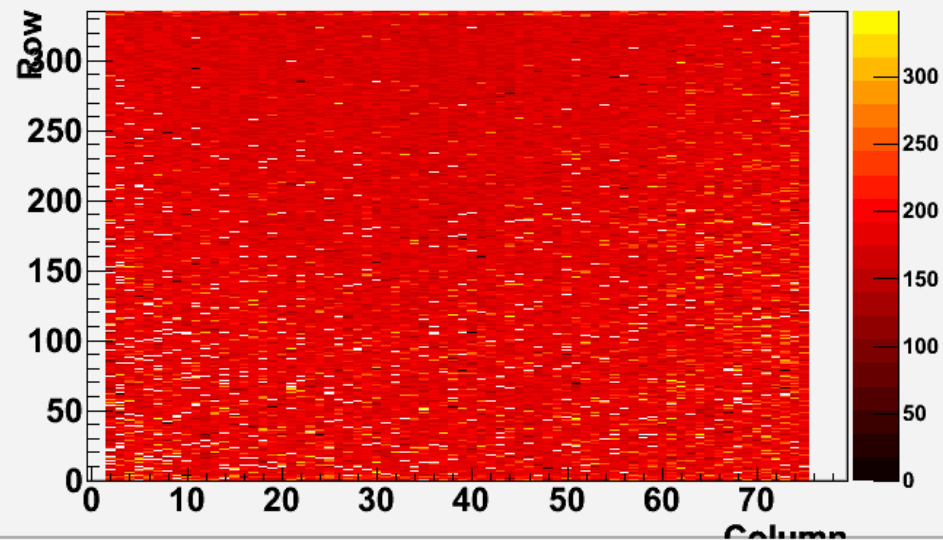
ToTMean mod 0 bin 0 chip 0



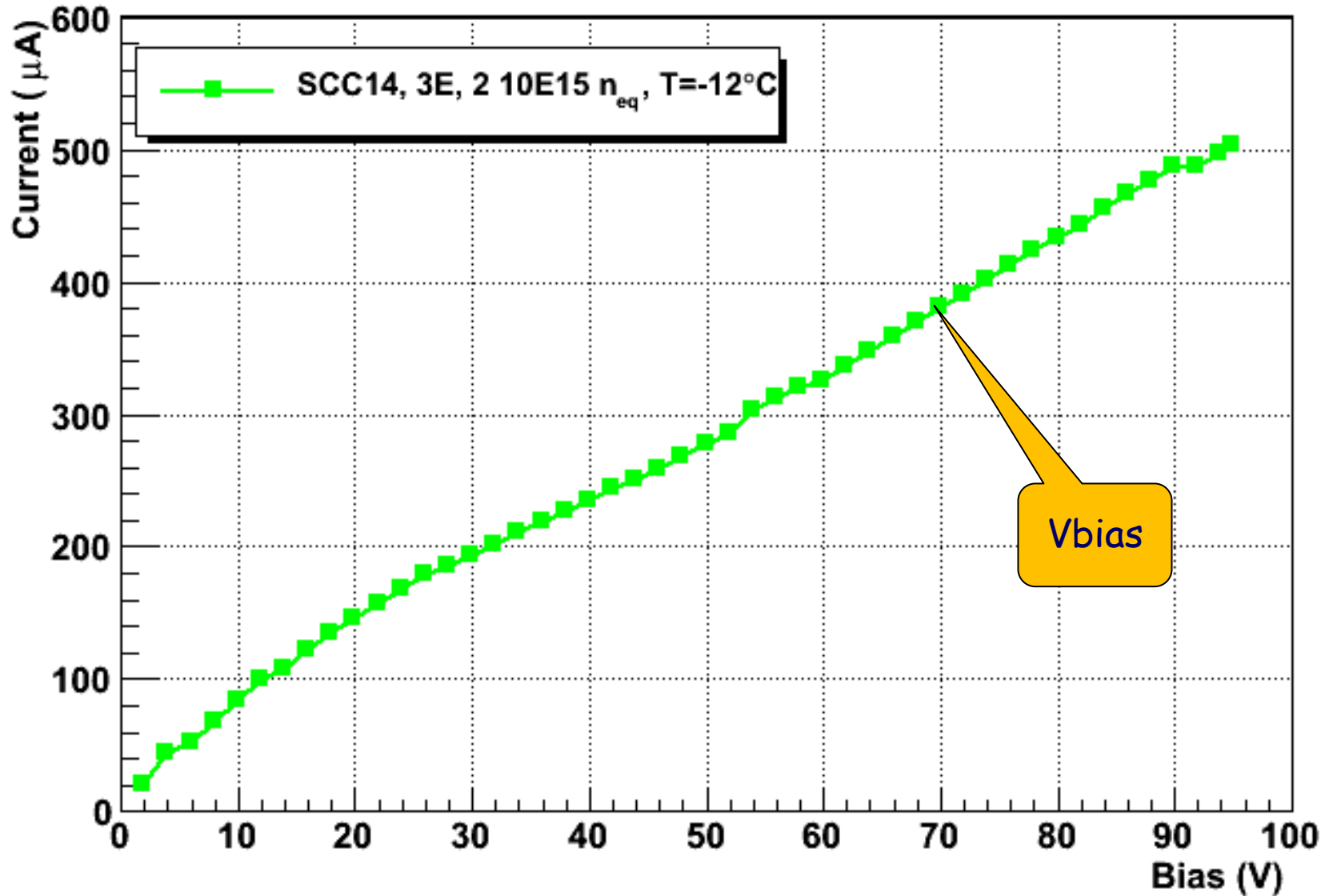
TOT_MEAN: tot_calib.

Module "FEI4"

ToTMean mod 0 bin 0 - accumulated - chip 0



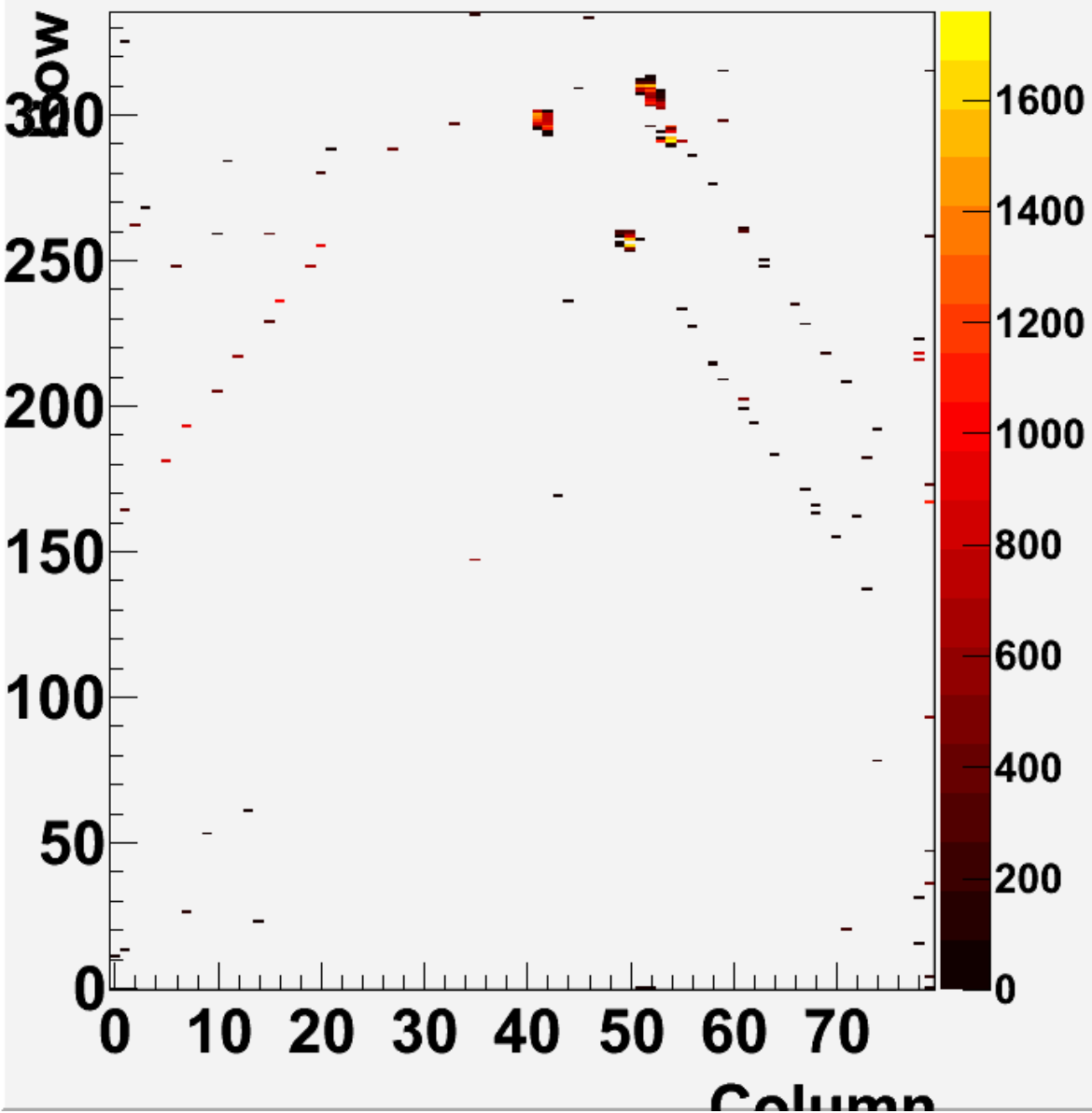
Current vs HV After Irradiation



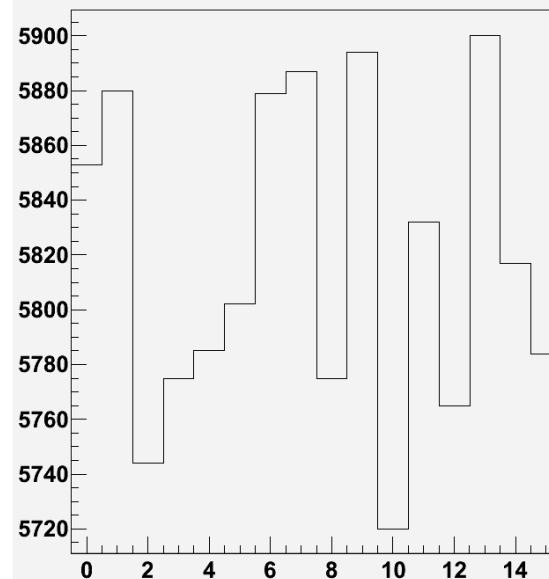
Vbias



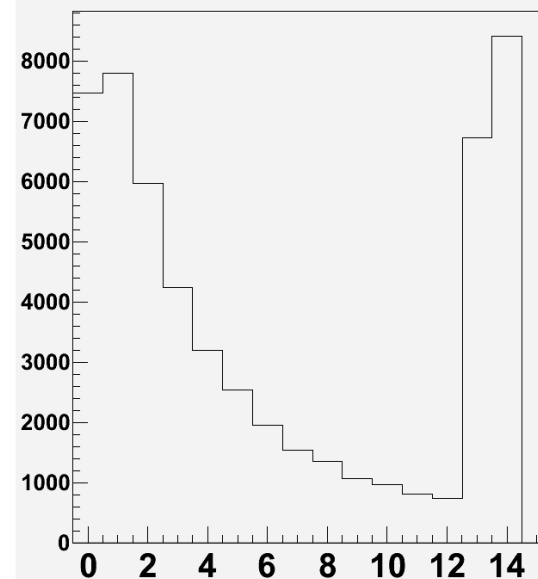
Occupancy mod 0 bin 0 chip 0



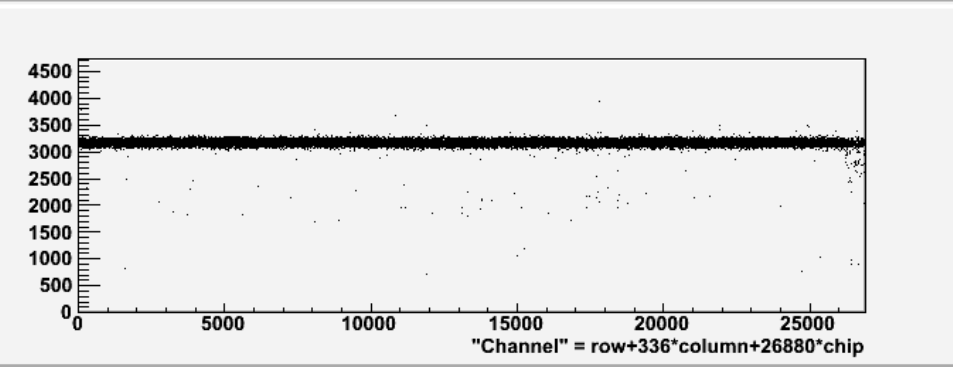
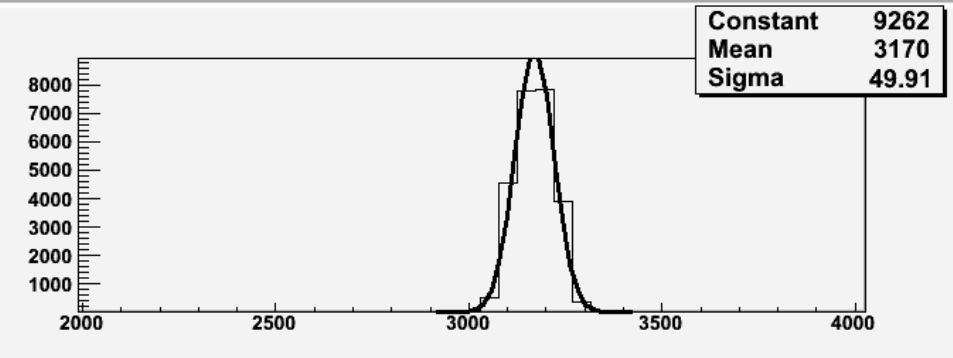
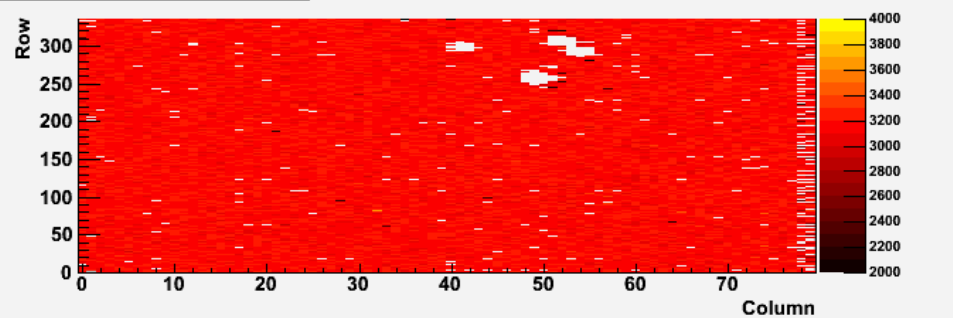
LVL1 mod 0 bin 0



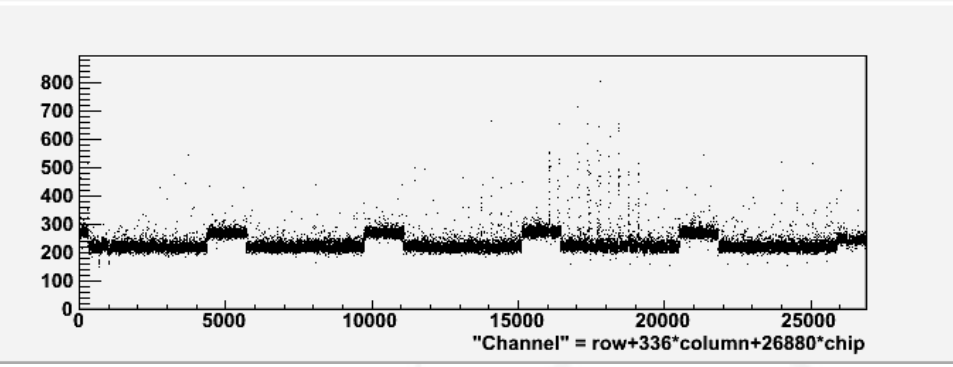
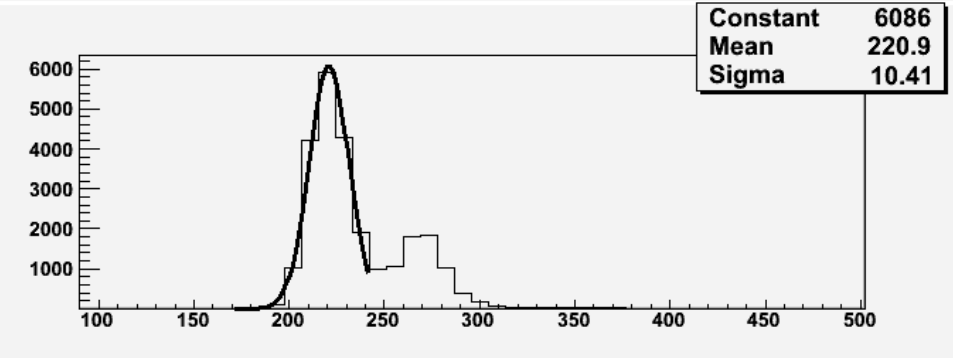
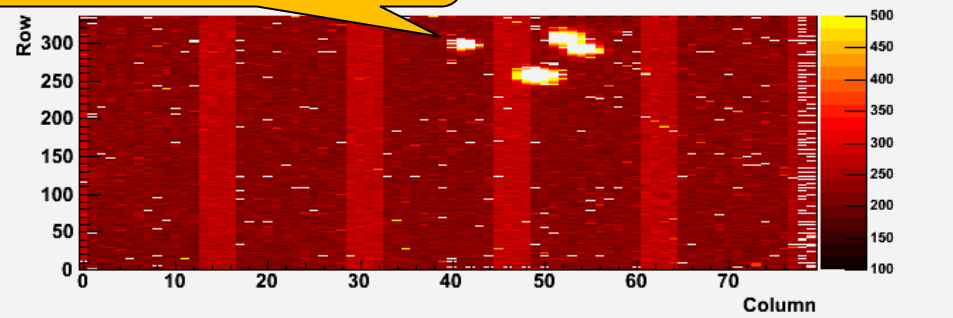
ToT mod 0 bin 0



Threshold mod 0 chip 0



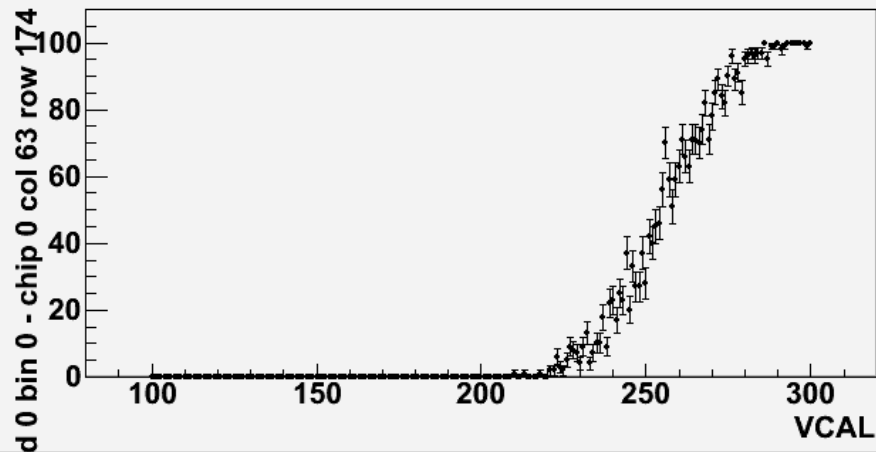
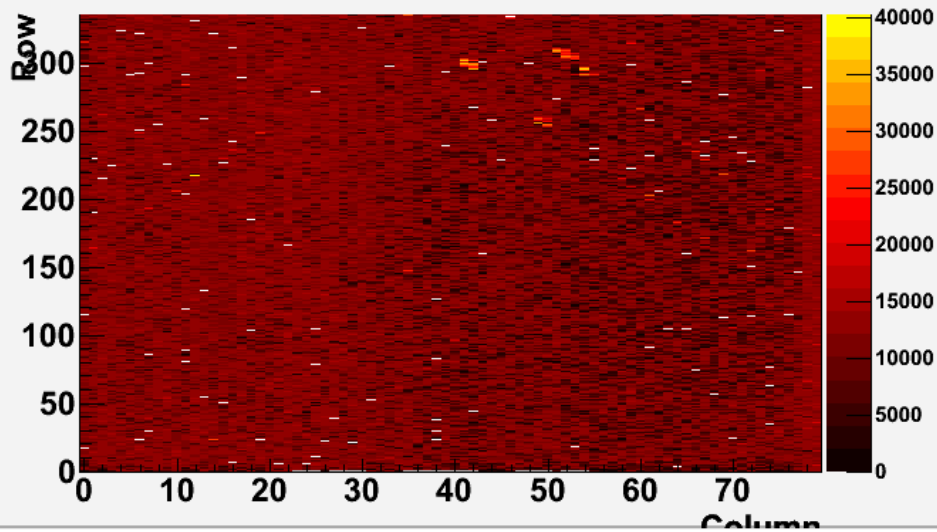
hotspots,
masked in data taking



OCCUPANCY: THRESHOLD_SCAN tuned Clow 100-300.

Module "FEI4"

Occupancy mod 0 bin 0 - accumulated - chip 0

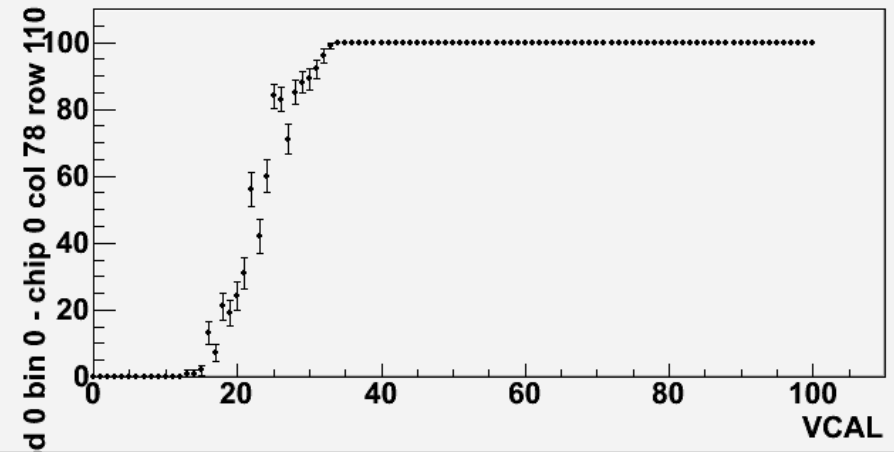
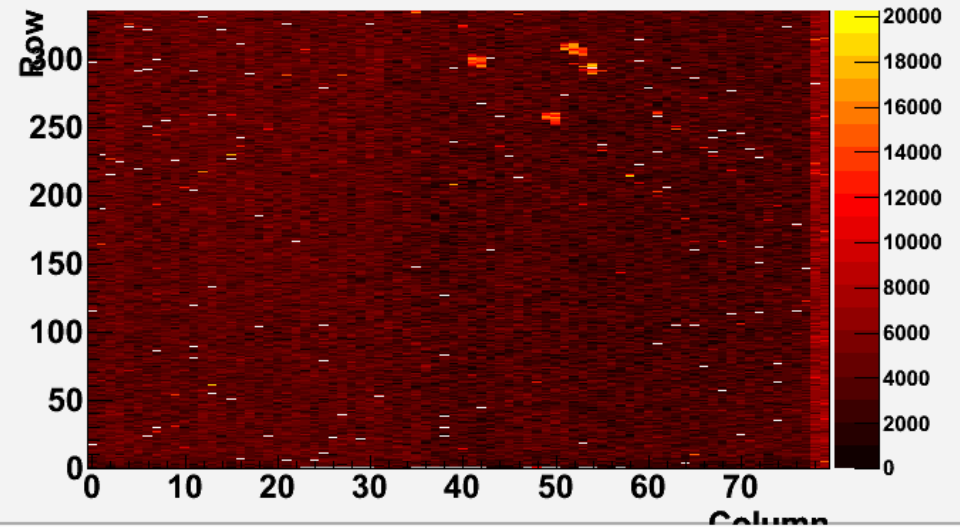


thr. high, "noise" in rising part

OCCUPANCY: THRESHOLD_SCAN 2.

Module "FEI4"

Occupancy mod 0 bin 0 - accumulated - chip 0

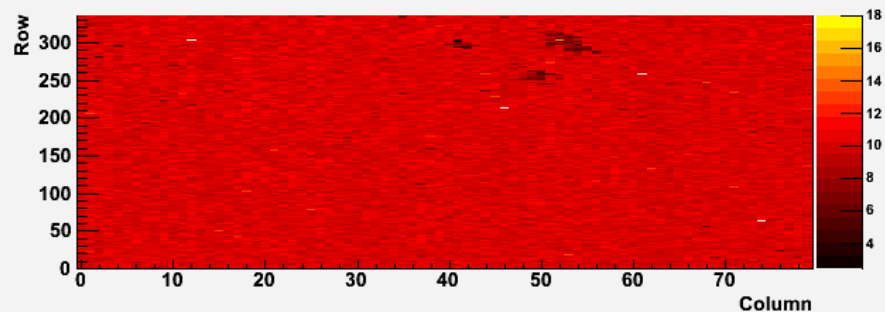


thr. low, Scurve kind of ok

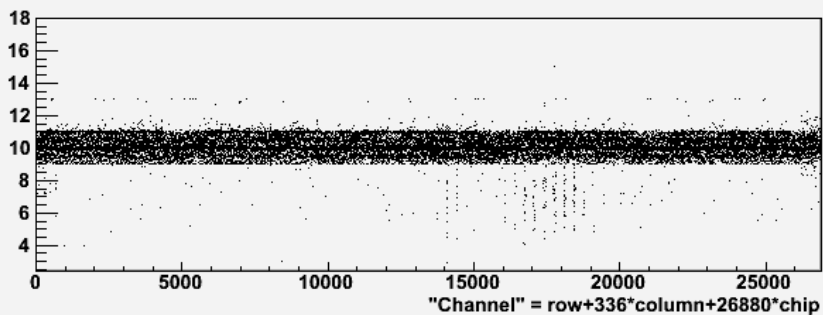
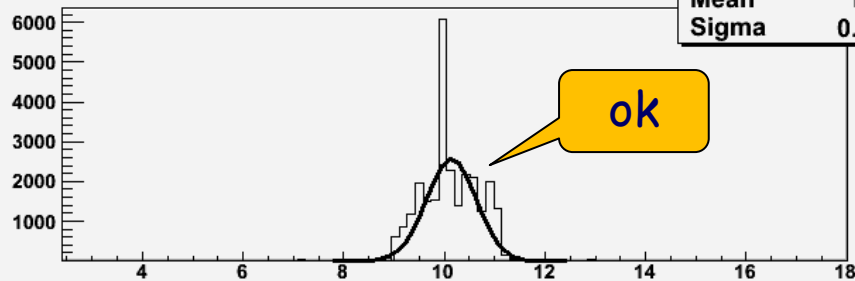
TOT_MEAN: TOT_VERIF 2.

Module "FEI4"

ToTMean mod 0 bin 0 chip 0



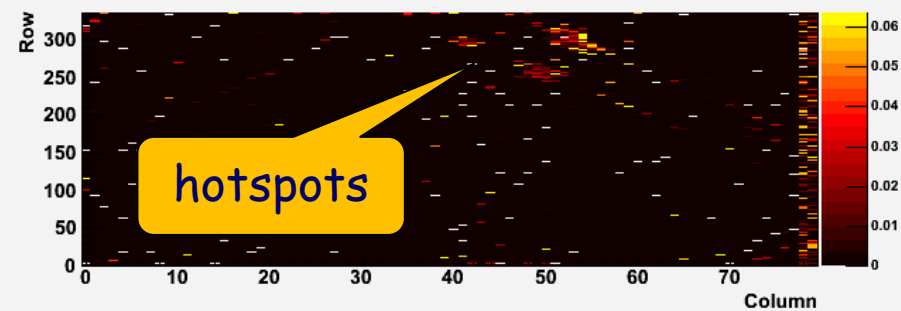
Constant	2554
Mean	10.14
Sigma	0.4931



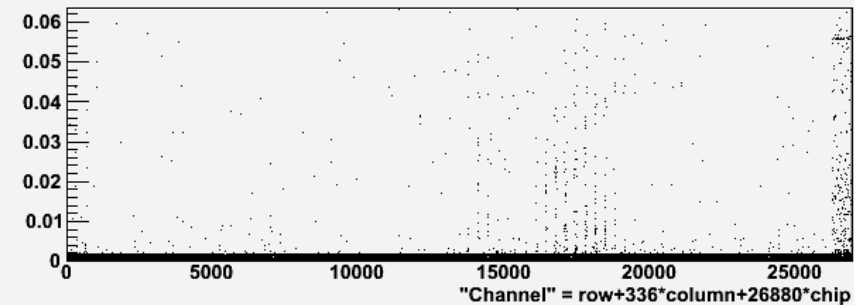
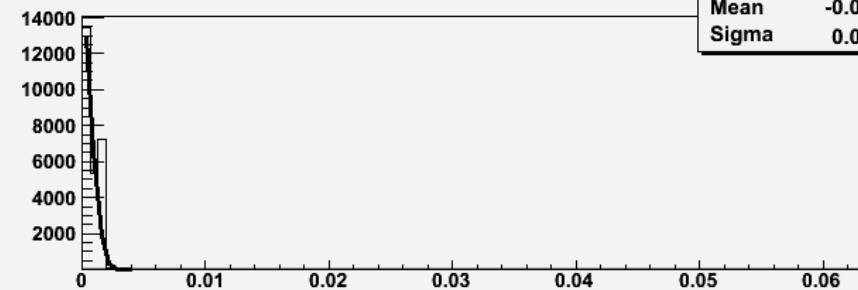
TOT_SIGMA: TOT_VERIF 2.

Module "FEI4"

ToTSigma mod 0 bin 0 chip 0



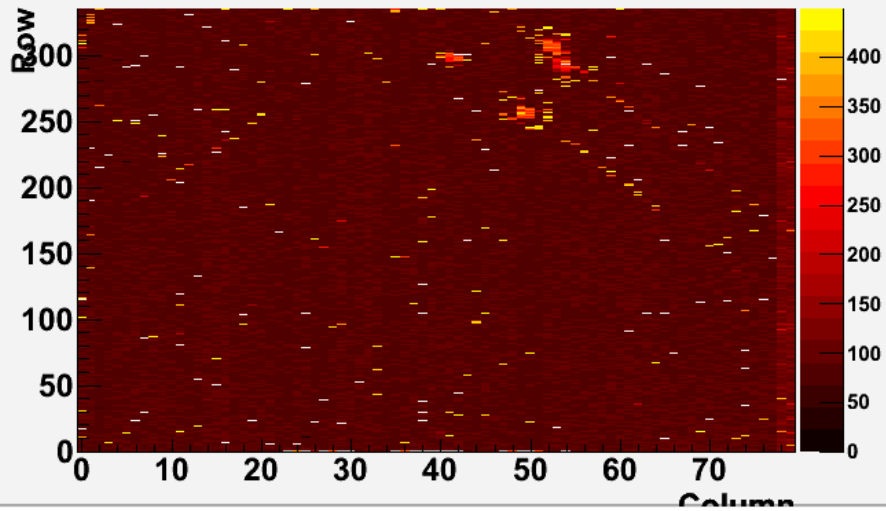
Constant	1.508e+004
Mean	-0.0001523
Sigma	0.0008516



TOT_MEAN: TOT_CALIB 2.

Module "FEI4"

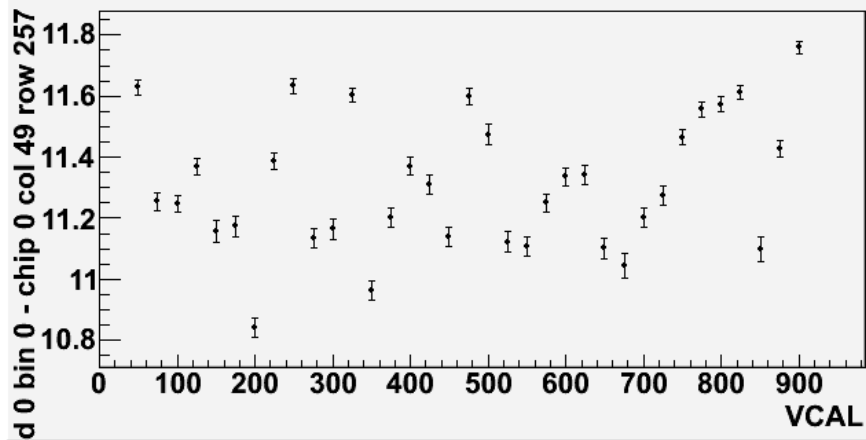
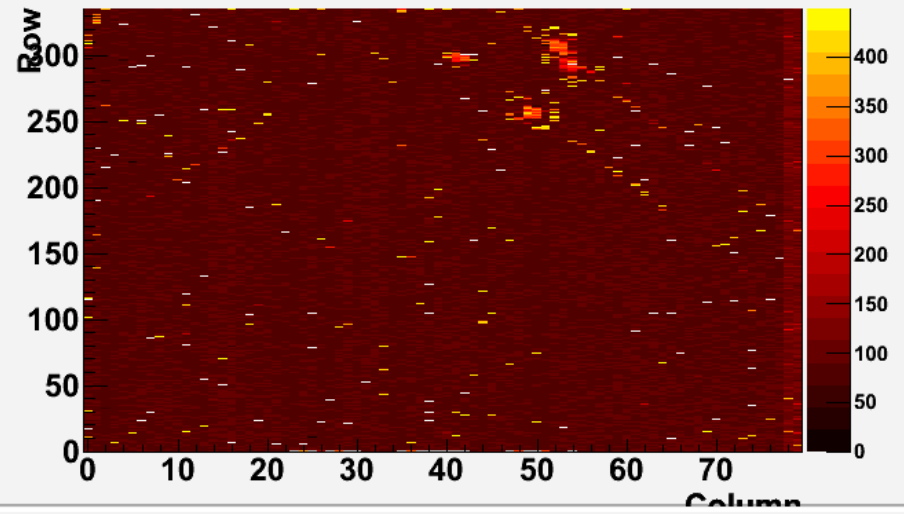
ToTMean mod 0 bin 0 - accumulated - chip 0



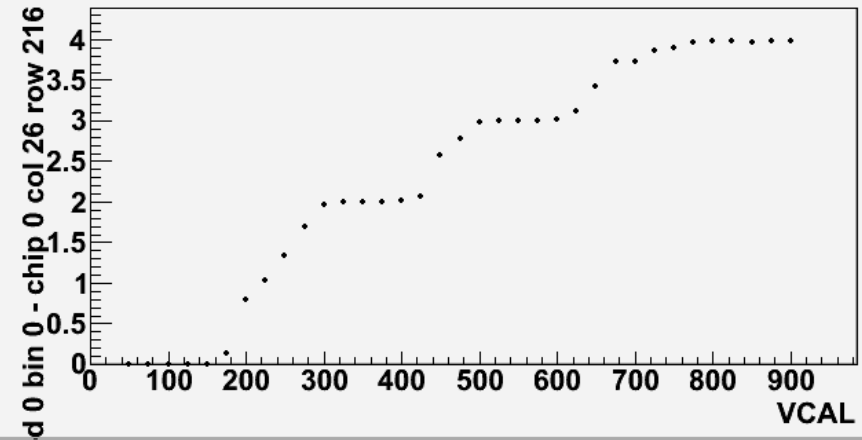
TOT_MEAN: TOT_CALIB 2.

Module "FEI4"

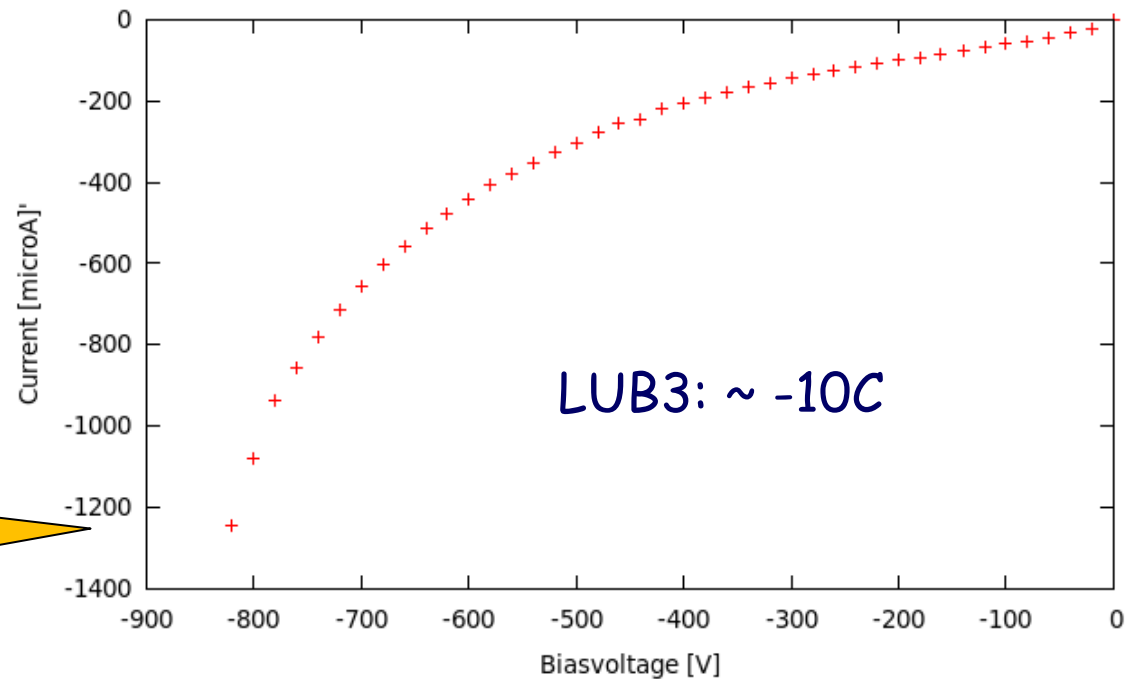
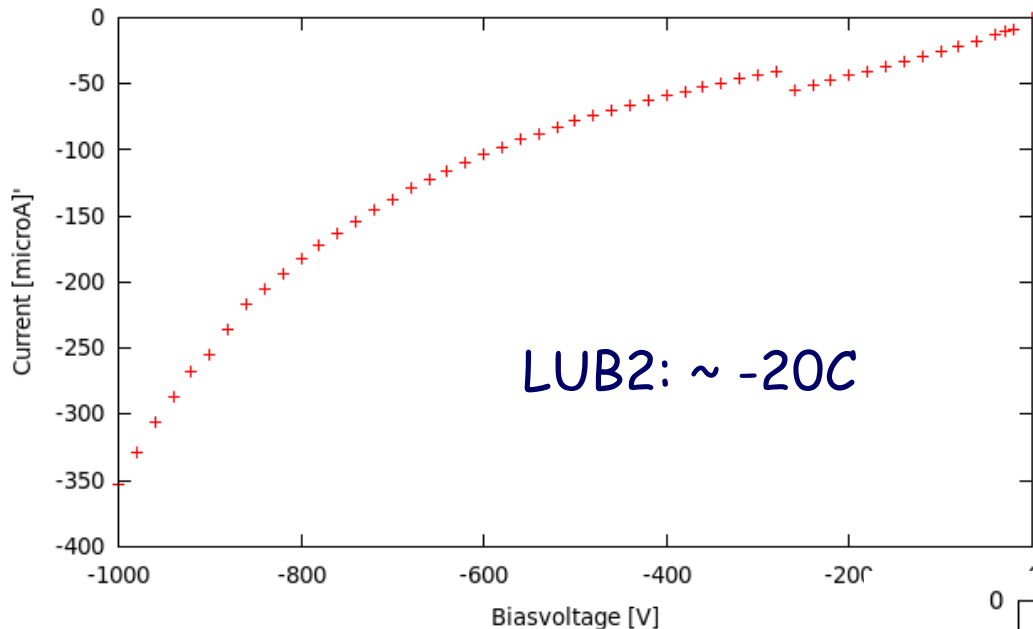
ToTMean mod 0 bin 0 - accumulated - chip 0



bad



good

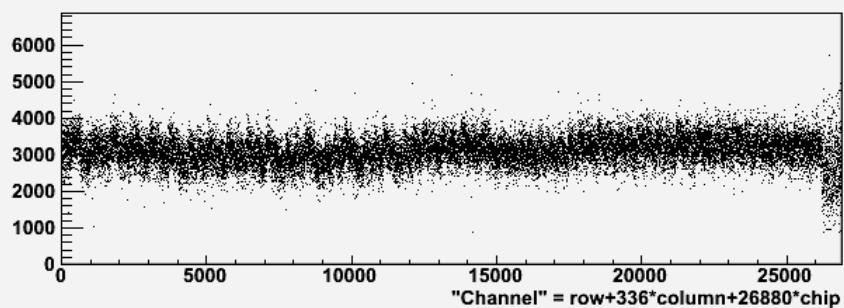
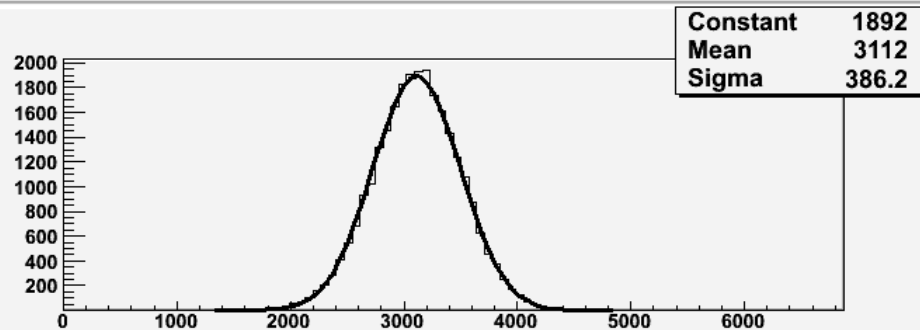
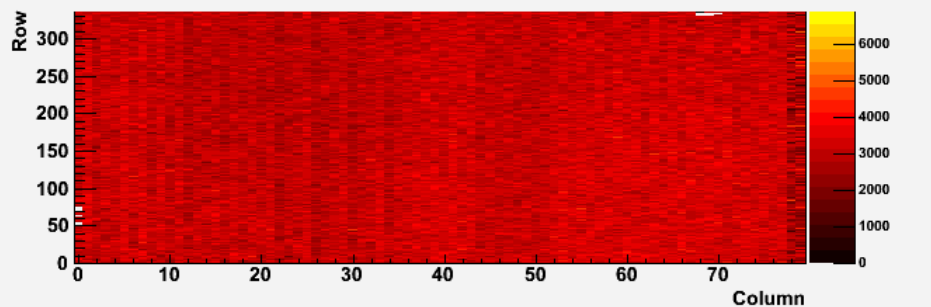


thermal runaway in freezer;
data taking at -1000V,
I_{leak} ~ 50uA at -39C

SCURVE_MEAN: THRESHOLD_SCAN.

Module "FEI4"

Threshold mod 0 chip 0



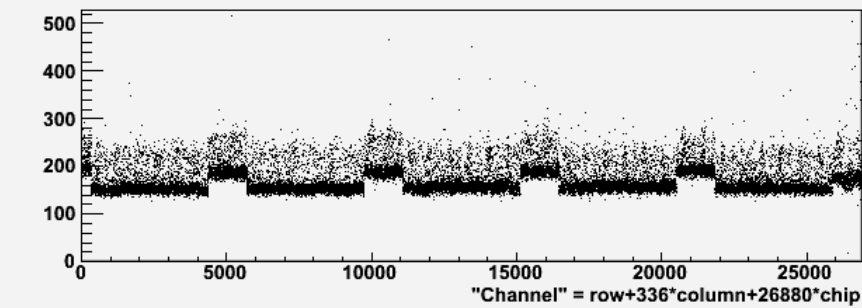
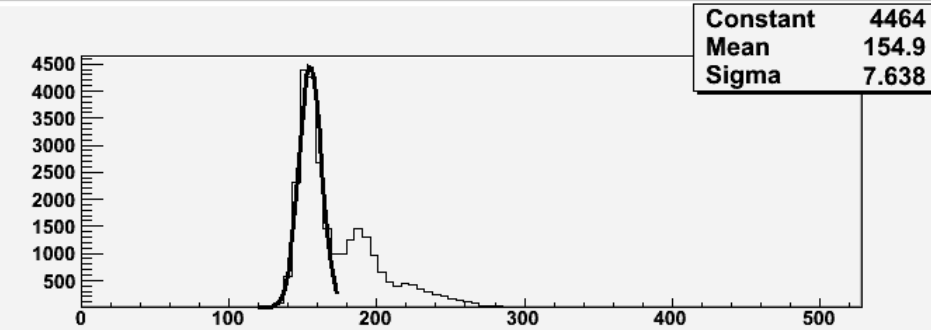
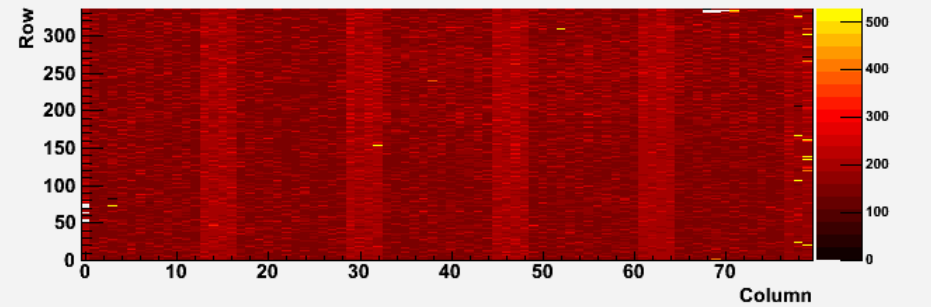
threshold:

TDAC tuning VERY delicate

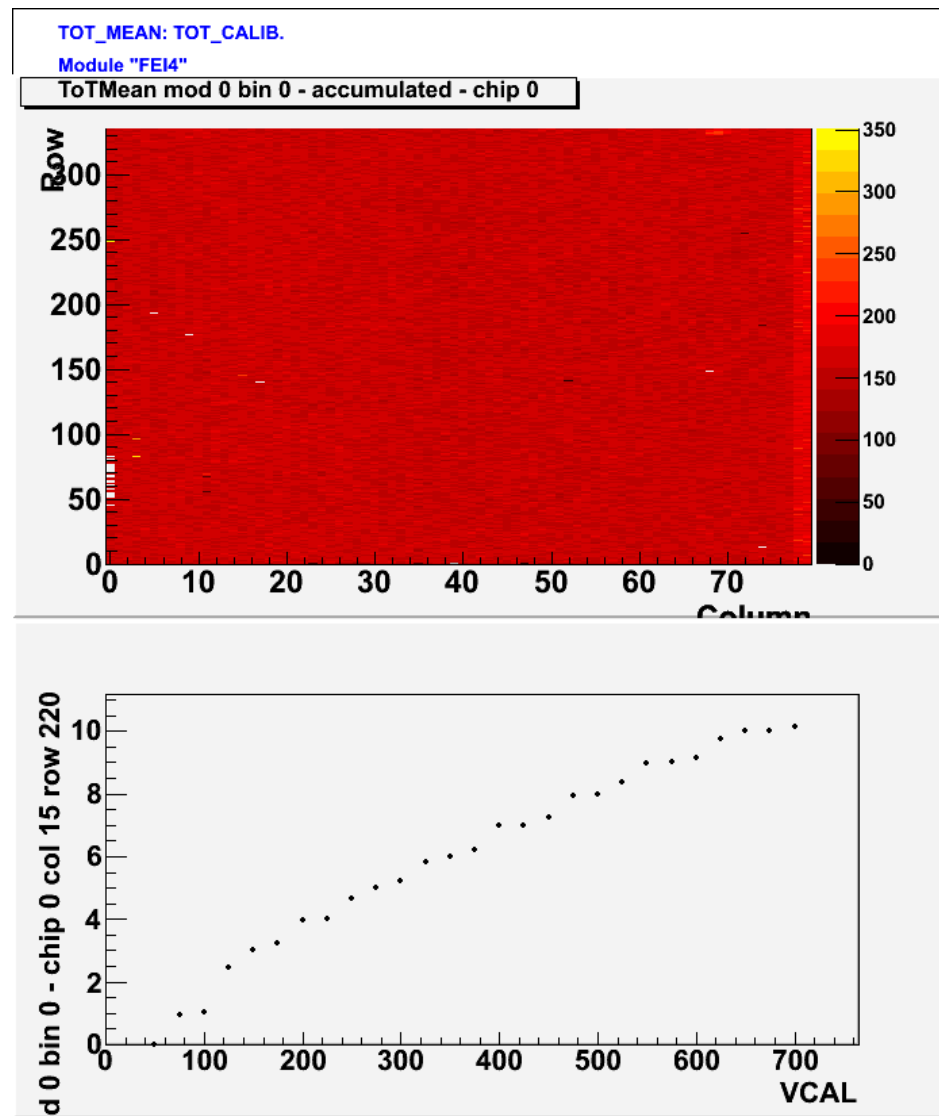
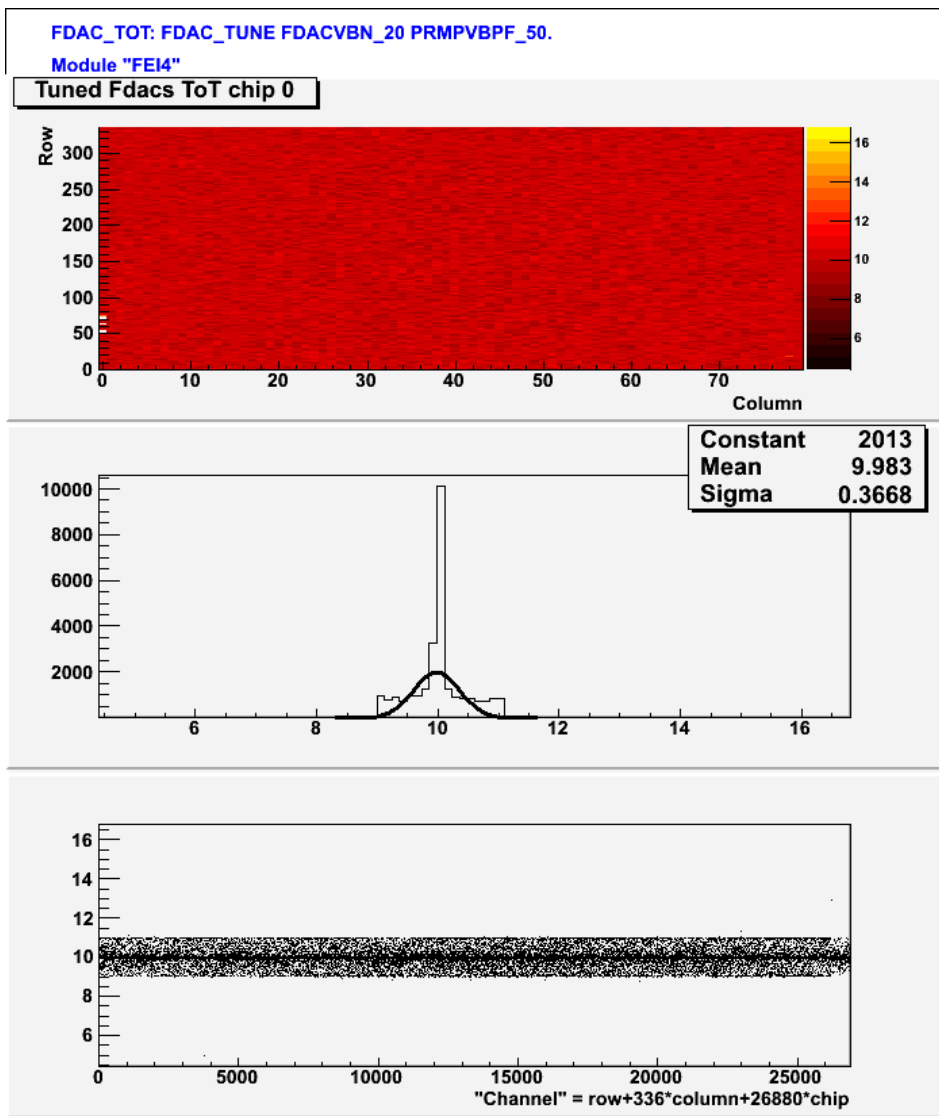
SCURVE_SIGMA: THRESHOLD_SCAN.

Module "FEI4"

Noise mod 0 chip 0



noise: ok



tuning: ok

LUB3 behaves the same

calib: not nice, but
as before irradi.