BPIX Module Testing Status - Week 3

22nd January 2007

Production overview

Production Status: 379 modules produced (355 / 24)

- 264/53 graded as A/B $\longrightarrow$ 84%
- 62 graded as C $\longrightarrow$ 16%

Module Testing Report of Week 3:

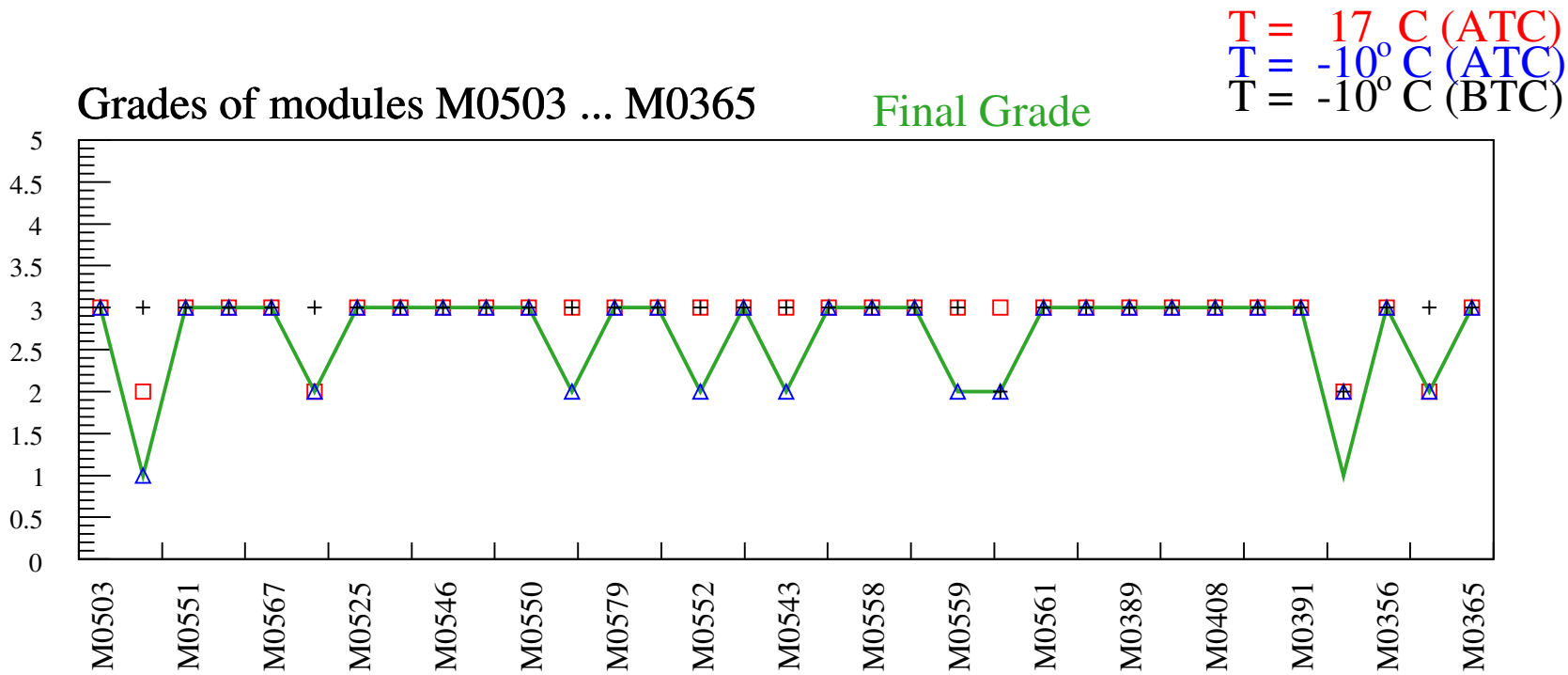
- 23/10 modules fully tested and therm. cycled (0 retested)

	Modules			*Half-Modules*		
Grade	**A**	**B**	**C**	**A**	**B**	**C**
T = -10^o C, BTC*	22	1	0	9	1	0
T = -10^o C, ATC	16	6	1	8	2	0
T = $+17^o$ C, ATC	21	2	0	8	2	0
Final Grade	16	6	1	8	1	1

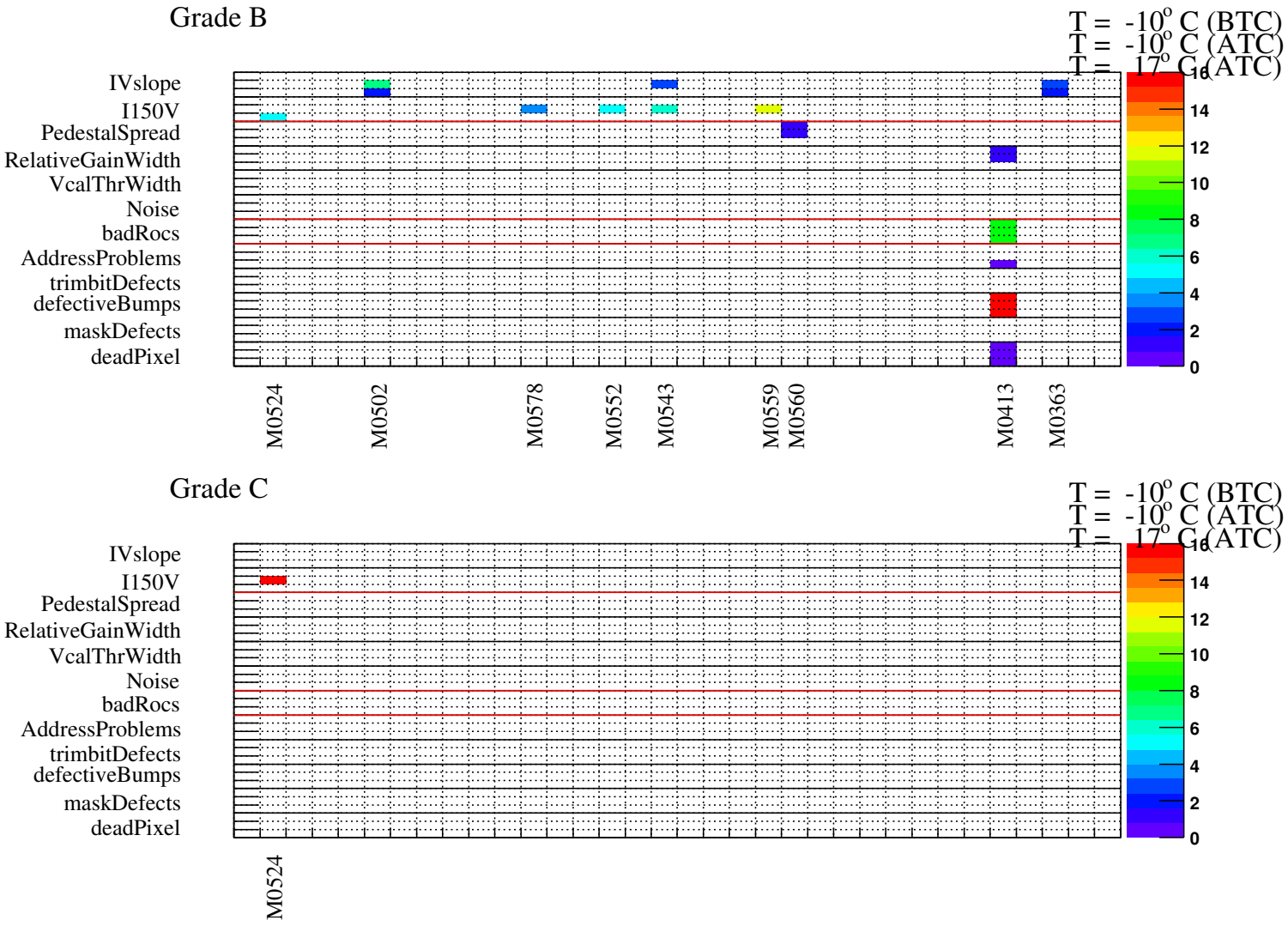
- 10 were retested with new DAC settings (2 change)
  - M0067: B -> C –> overall grades - M0145: A -> B –> overall grades

*without IV-criteria

Production summary

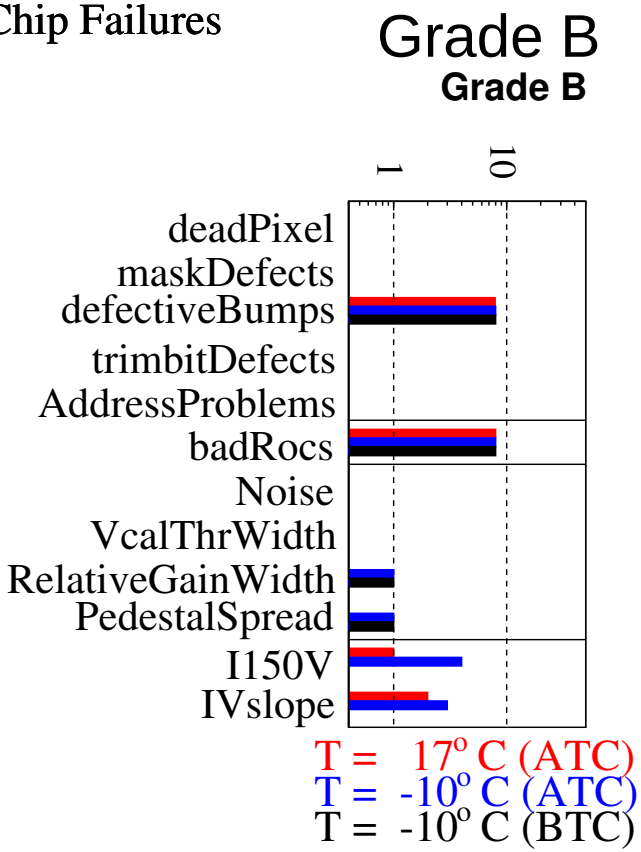


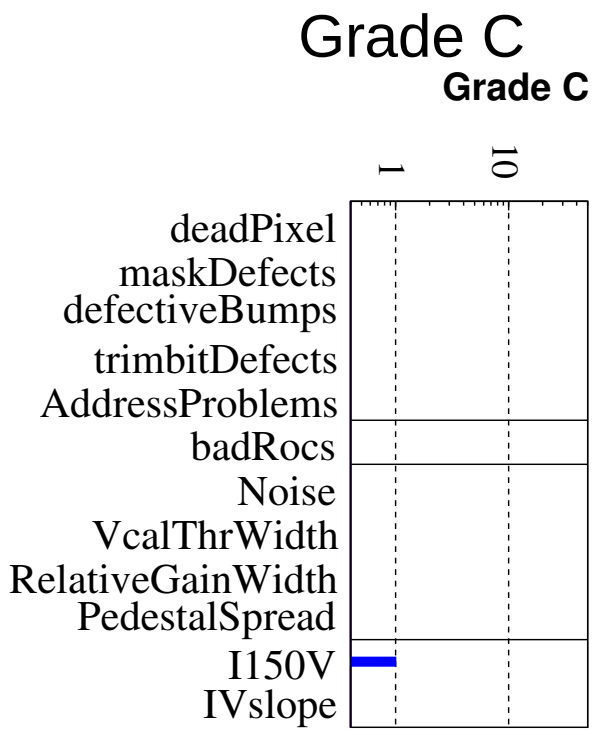
Module Failures Overview



Production quality

Chip Failures





← Pixel defects

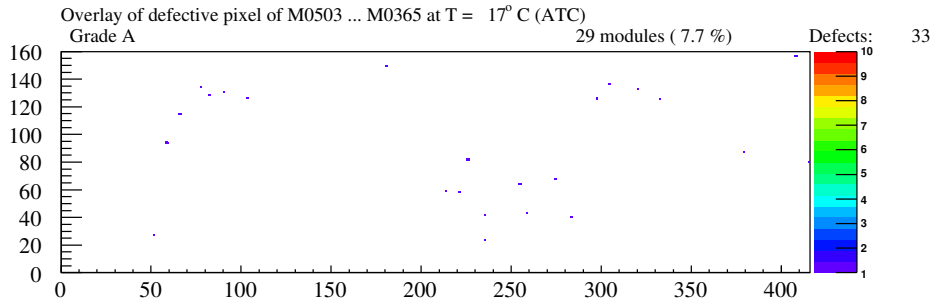
← Chip performance

← Module IV

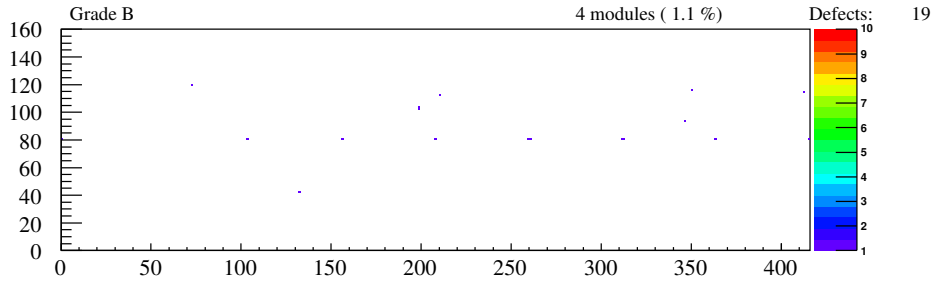
Defective pixel $T = 17^oC$ (ATC)

Overlay of all fully tested modules at T = $+17^o$ C (ATC)

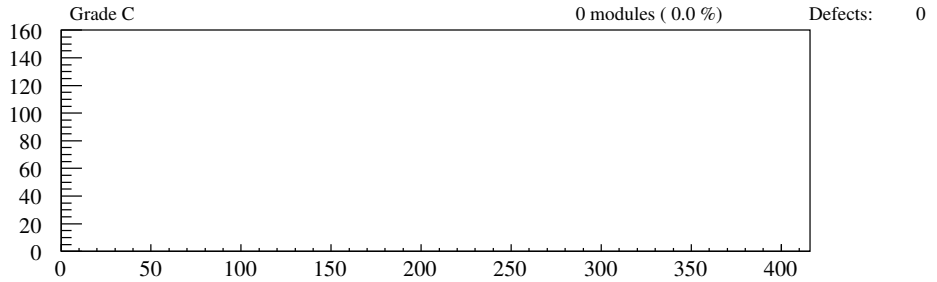
Grade A
(29 modules)



Grade B
(4 modules)



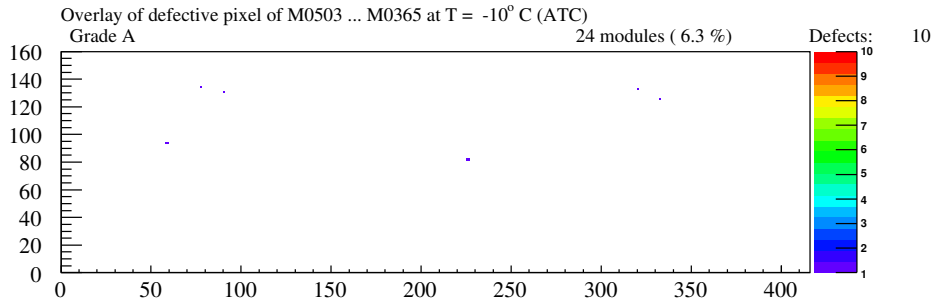
Grade C
(0 modules)



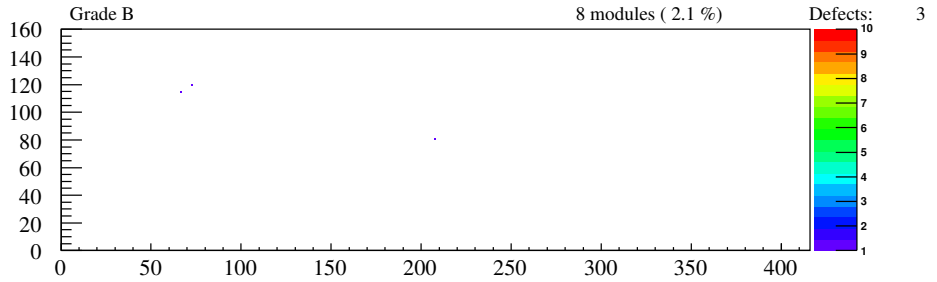
Defective pixel $T = -10^oC$ (ATC)

Overlay of all fully tested modules at T = -10^o C (ATC)

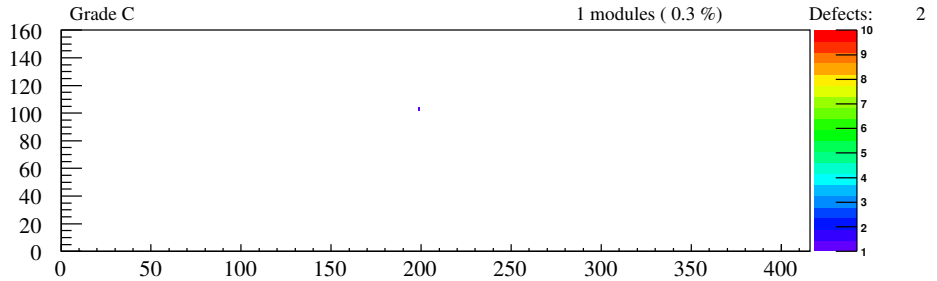
Grade A
(24 modules)



Grade B
(8 modules)



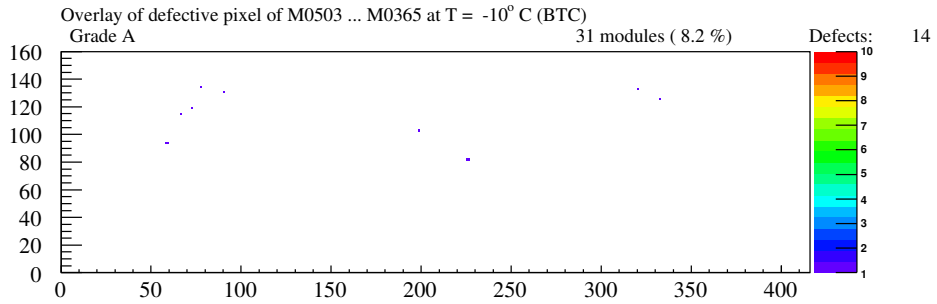
Grade C
(1 modules)



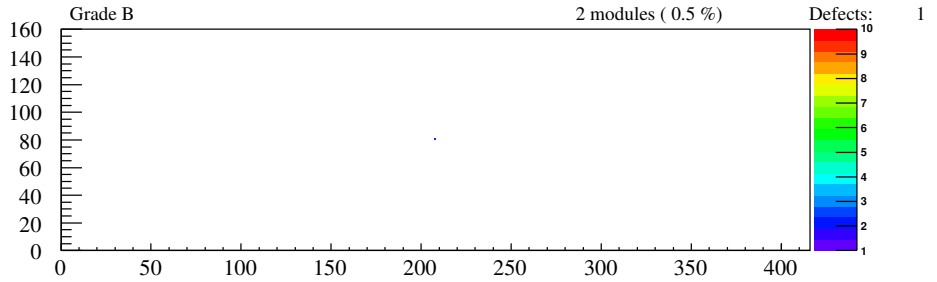
Defective pixel $T = -10^oC$ (BTC)

Overlay of all fully tested modules at T = -10^o C (BTC)

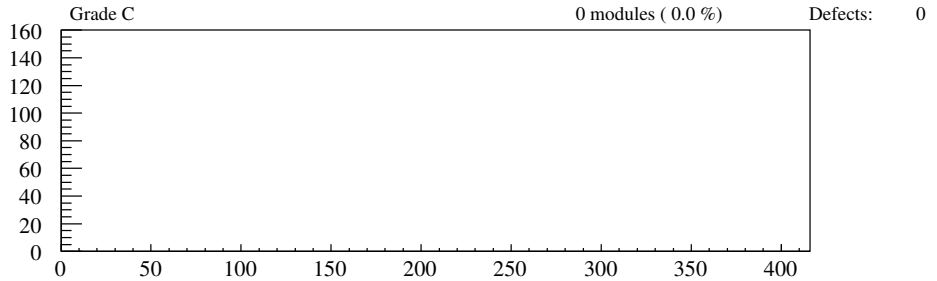
Grade A
(31 modules)



Grade B
(2 modules)



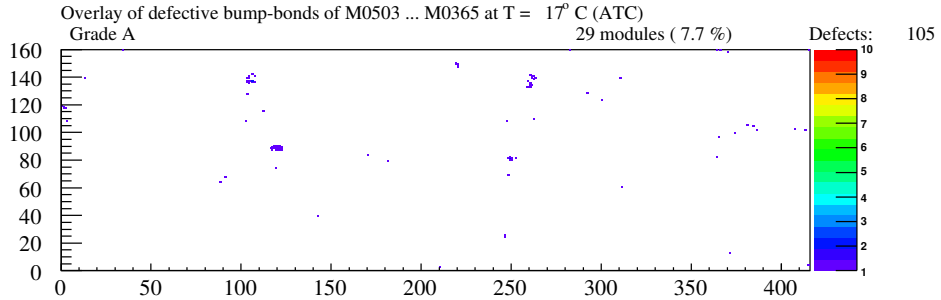
Grade C
(0 modules)



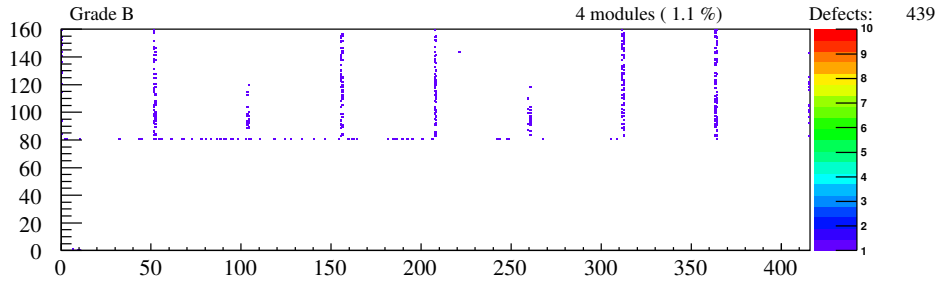
Defective bump-bonds $T = 17^oC$ (ATC)

Overlay of all fully tested modules at T = $+17^o$ C (ATC)

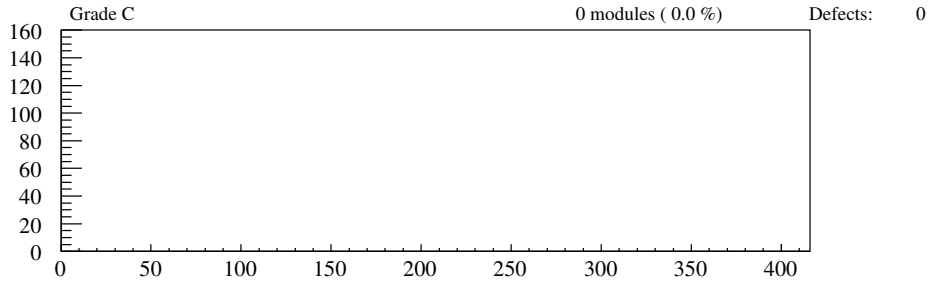
Grade A
(29 modules)



Grade B
(4 modules)



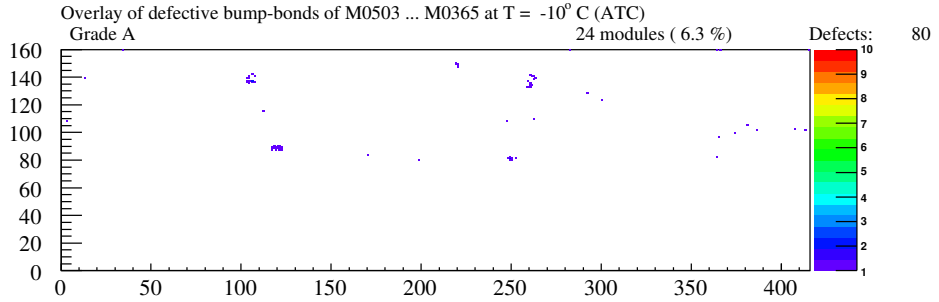
Grade C
(0 modules)



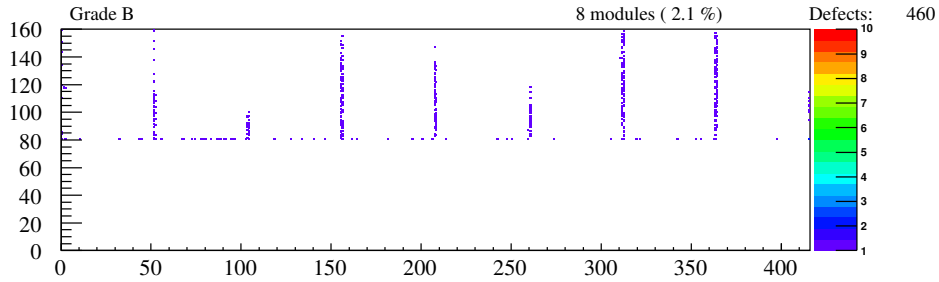
Defective bump-bonds $T = -10^oC$ (ATC)

Overlay of all fully tested modules at T = -10^o C (ATC)

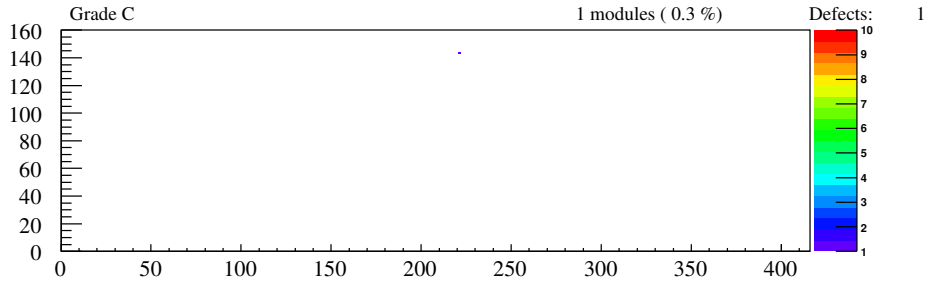
Grade A
(24 modules)



Grade B
(8 modules)



Grade C
(1 modules)



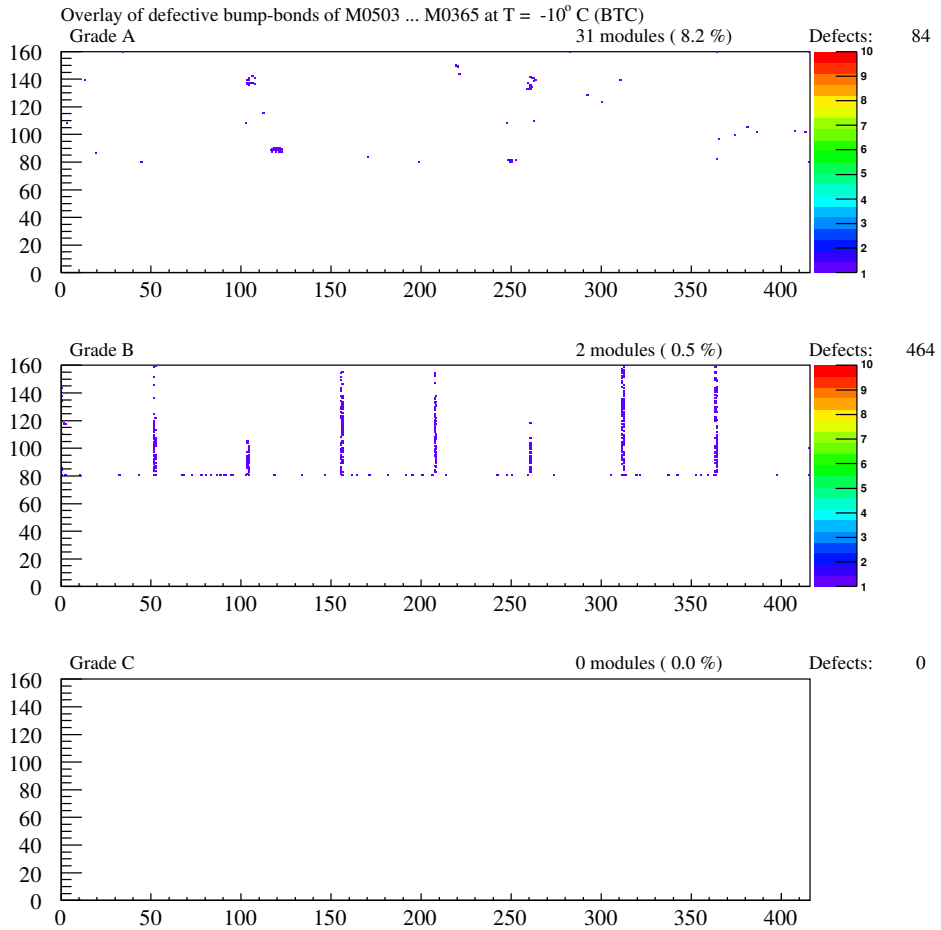
Defective bump-bonds $T = -10^oC$ (BTC)

Overlay of all fully tested modules at T = -10^o C (BTC)

Grade A
(31 modules)

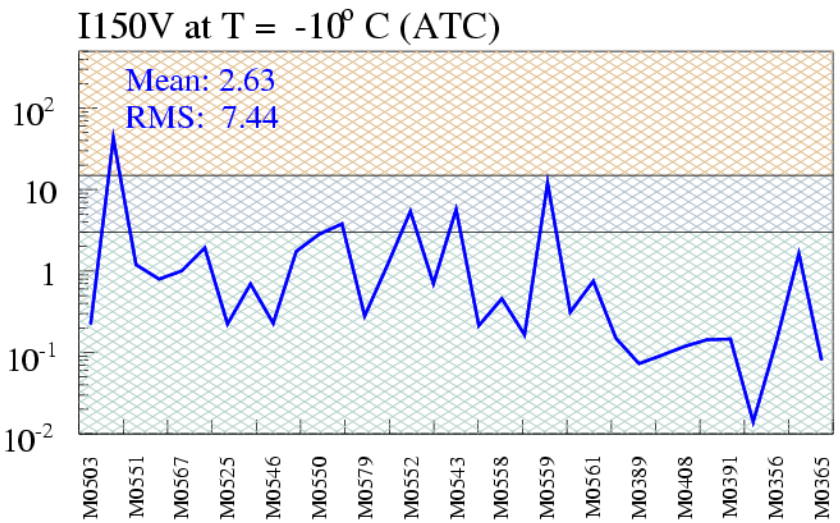
Grade B
(2 modules)

Grade C
(0 modules)

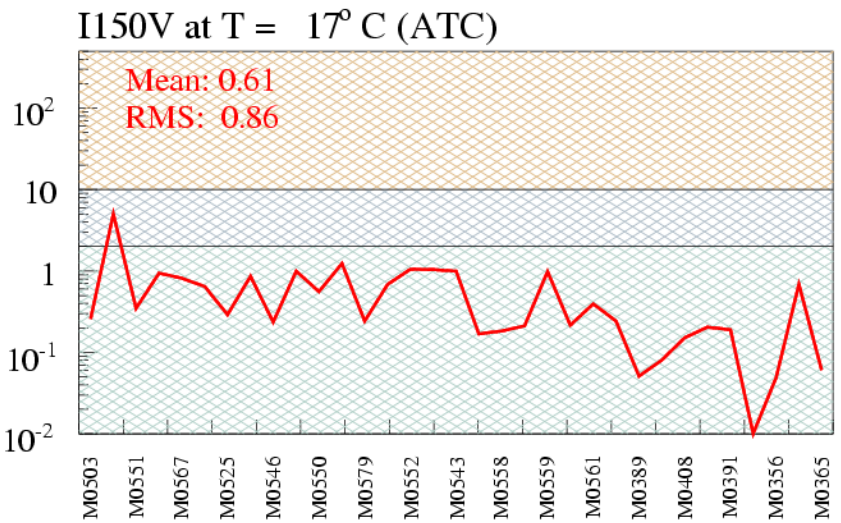


Current at 150 V

Current at 150 V (in μA) at $T = 17^oC$ and $T = -10^oC$



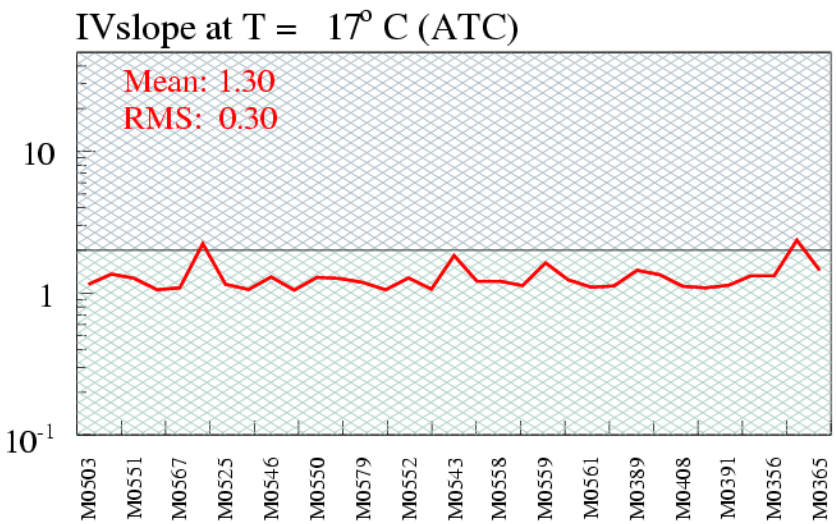
recalculated

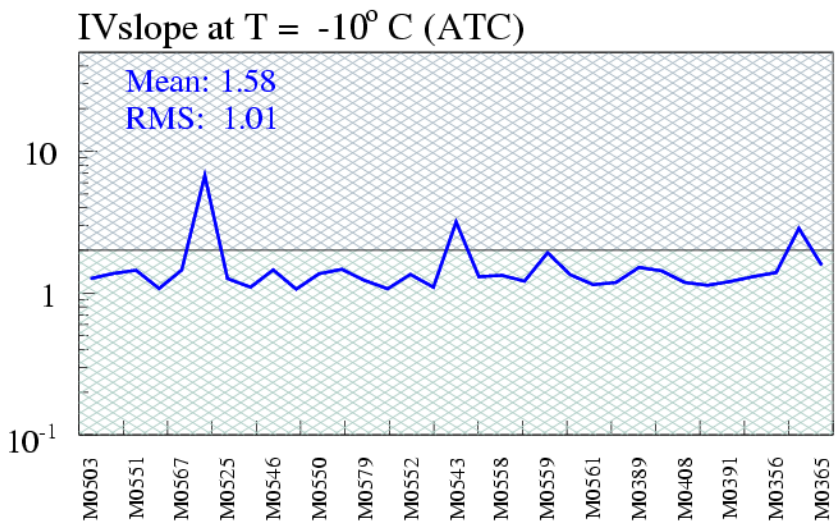


measured

Slope of IV-Curve

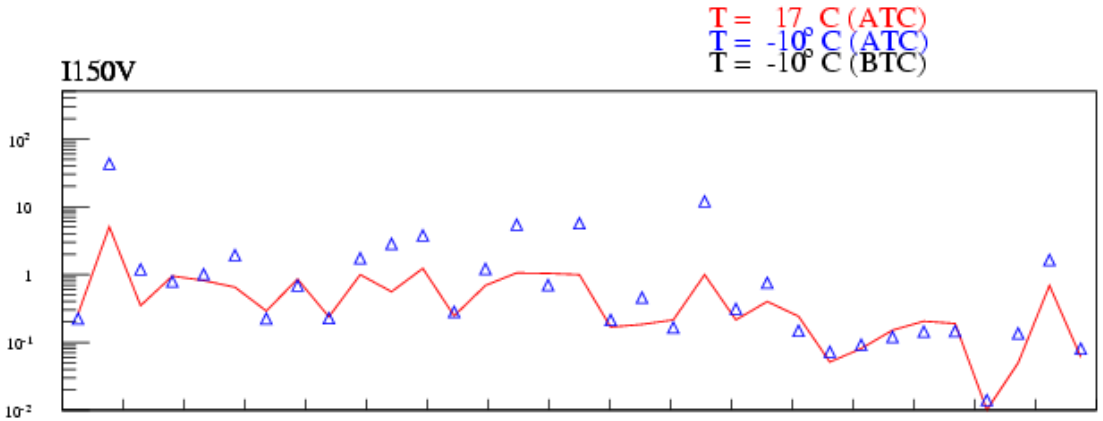
Slope of IV-Curveat $T = 17^oC$ and $T = -10^oC$

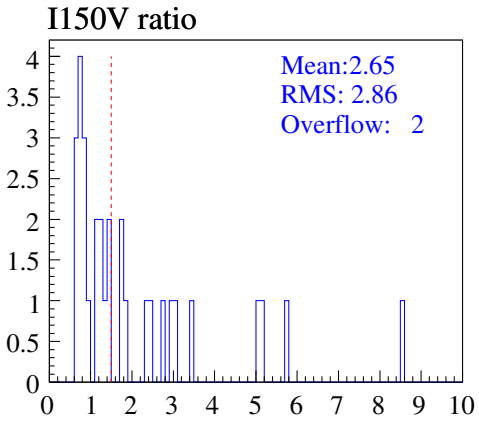


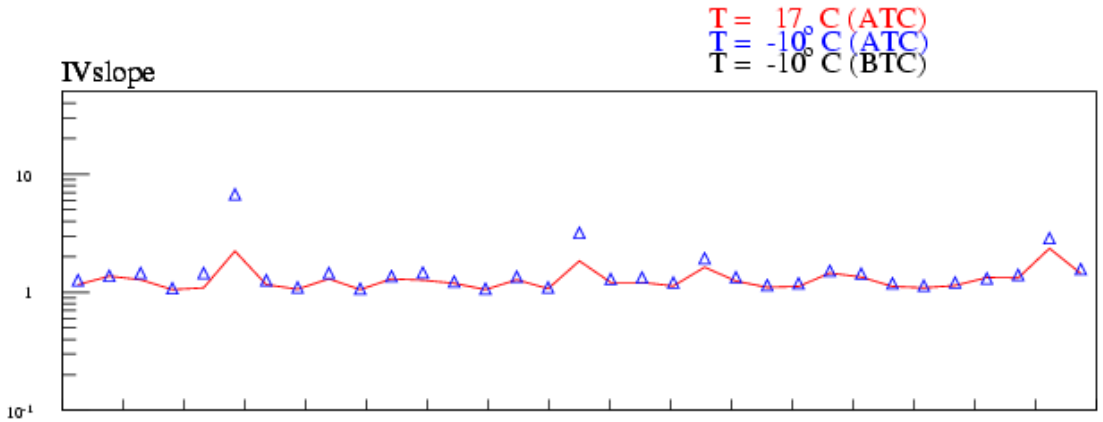


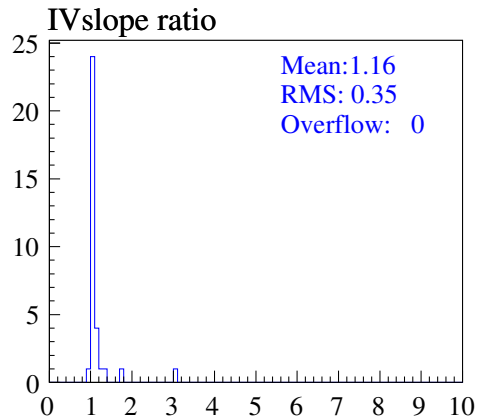
Current recalculation to $T = 17^oC$

Cross check of recalculated values with measured values



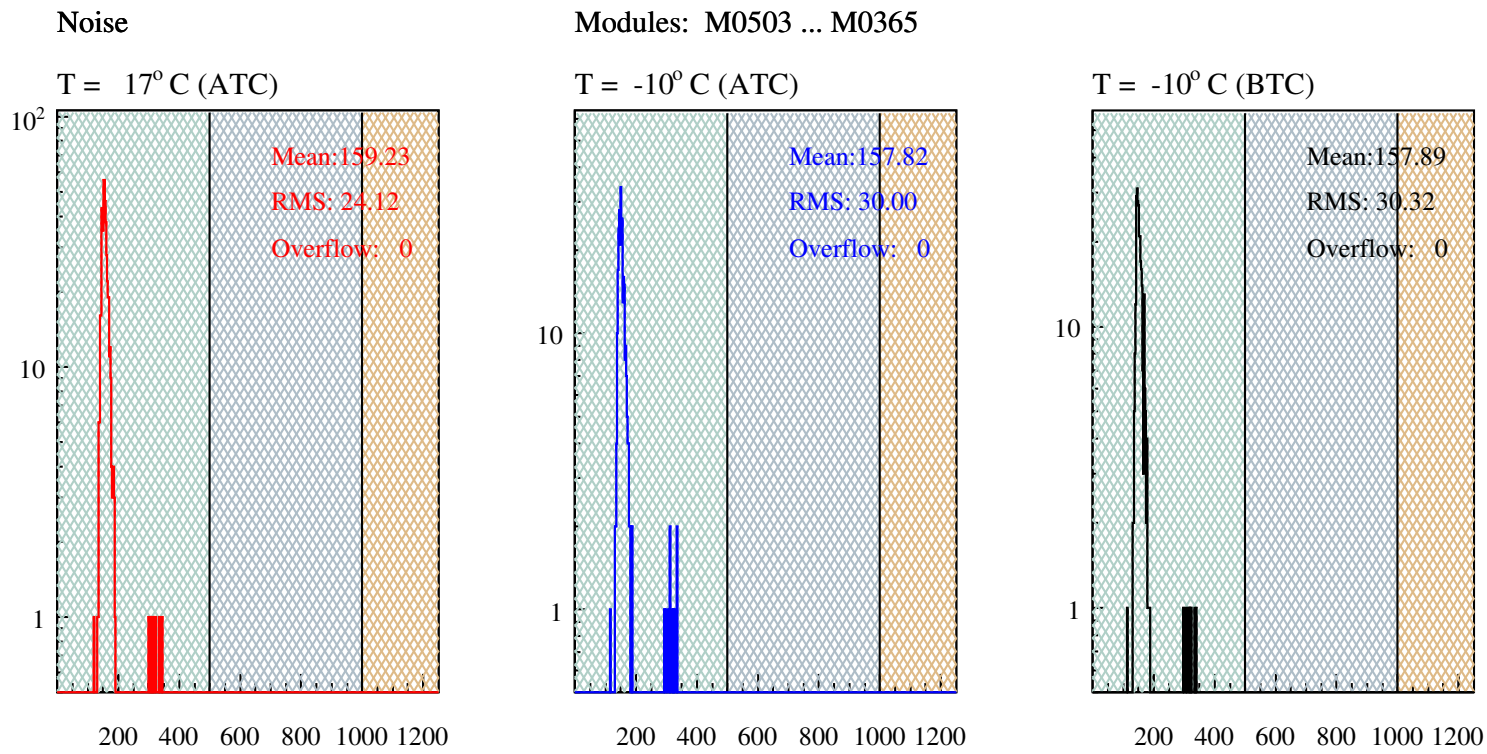






Noise

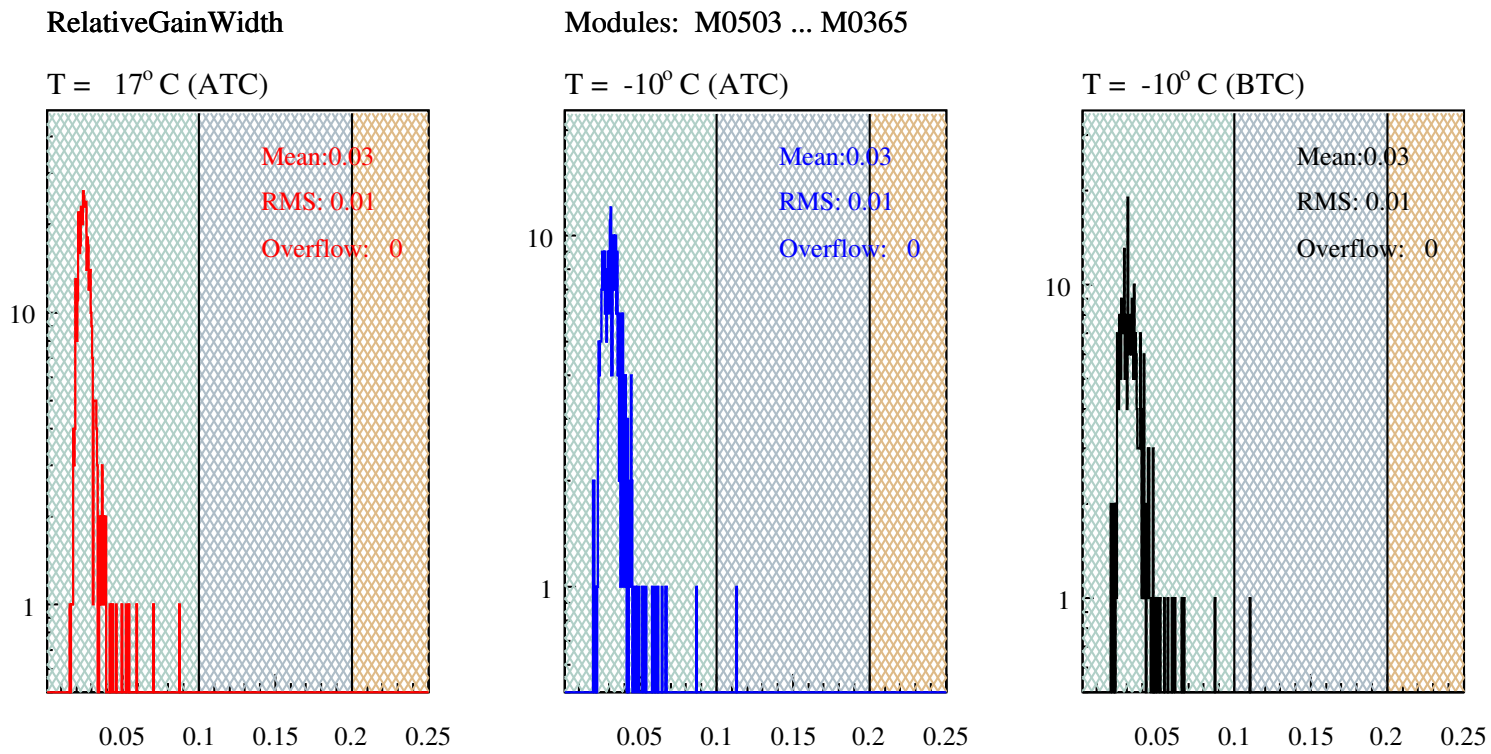
MeanNoise of chips



Noise in e^-

Relative Gain Width

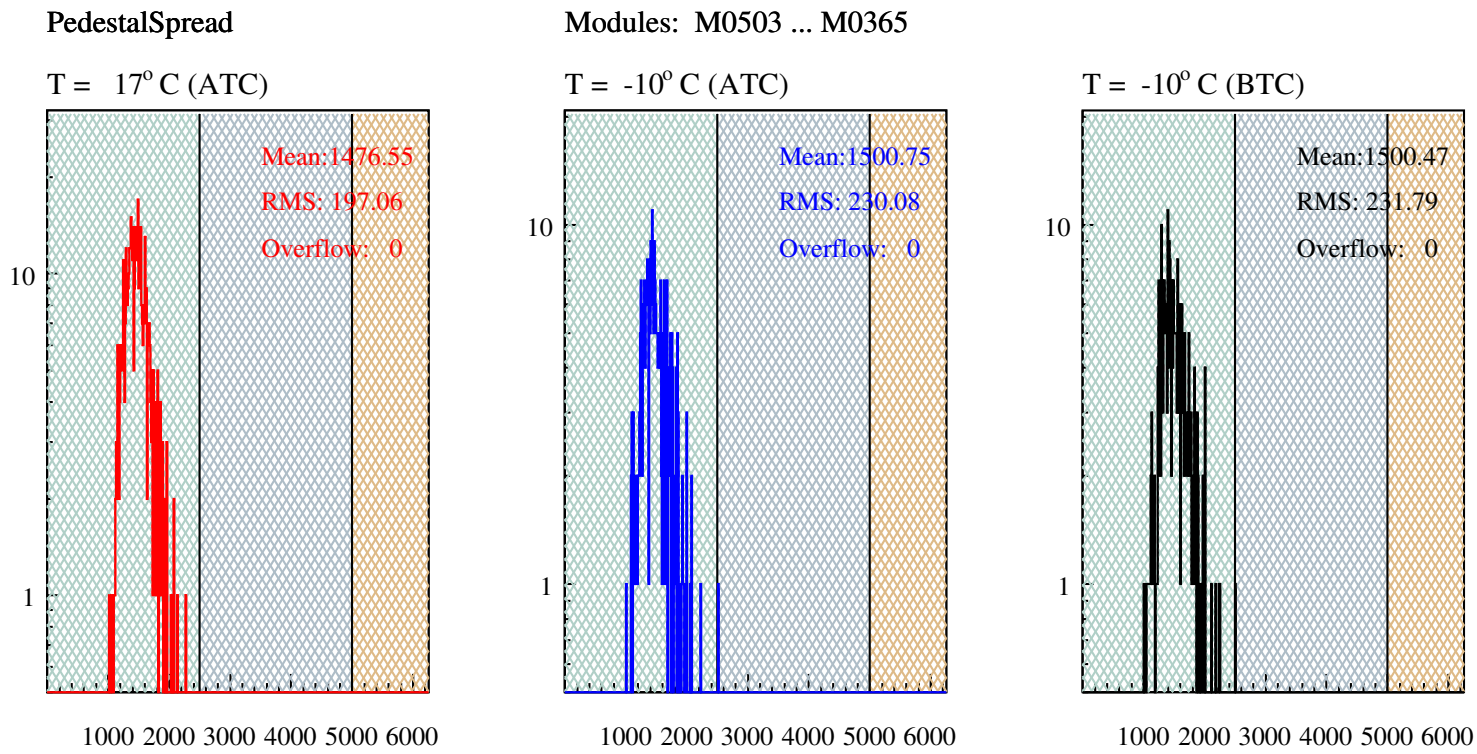
RelativeGainWidth of chips



Rel. Gain Width in %

Pedestal Spread

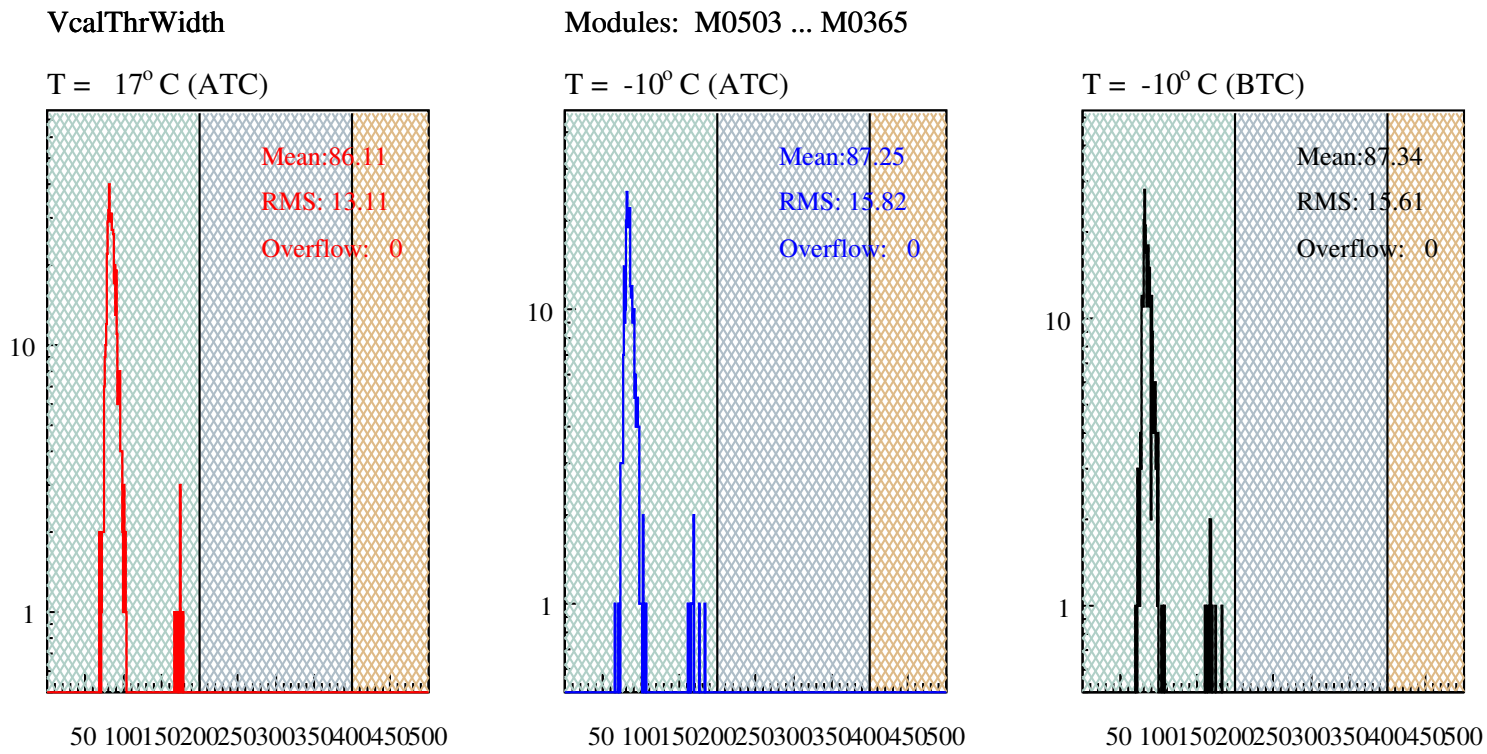
PedestalSpread of chips



Pedestal Spread in e^-

Vcal Threshold Width

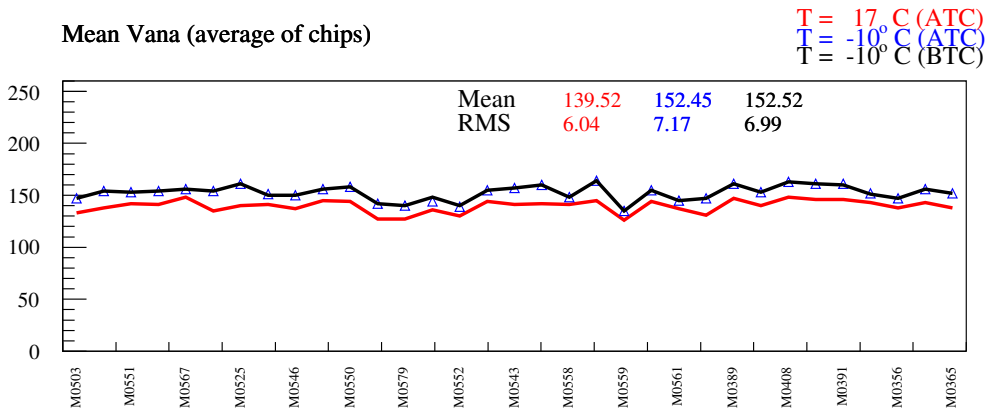
VcalThresholdWidth of chips

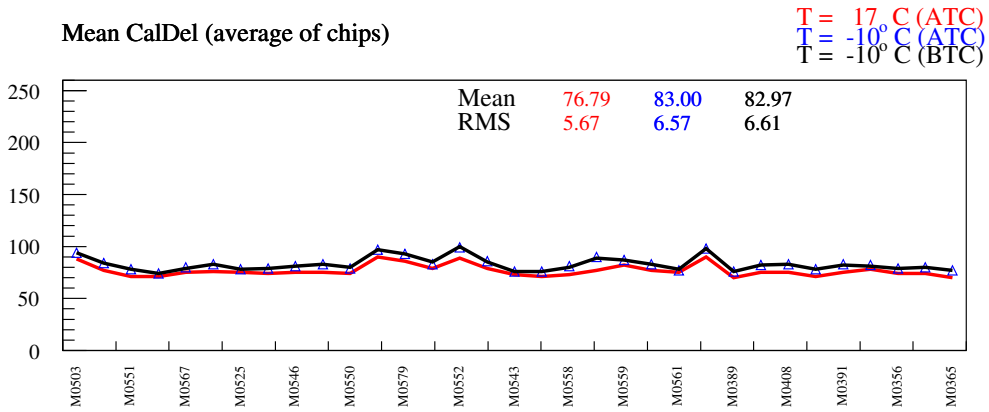


Vcal Thr. Width in e^-

Operational parameters I

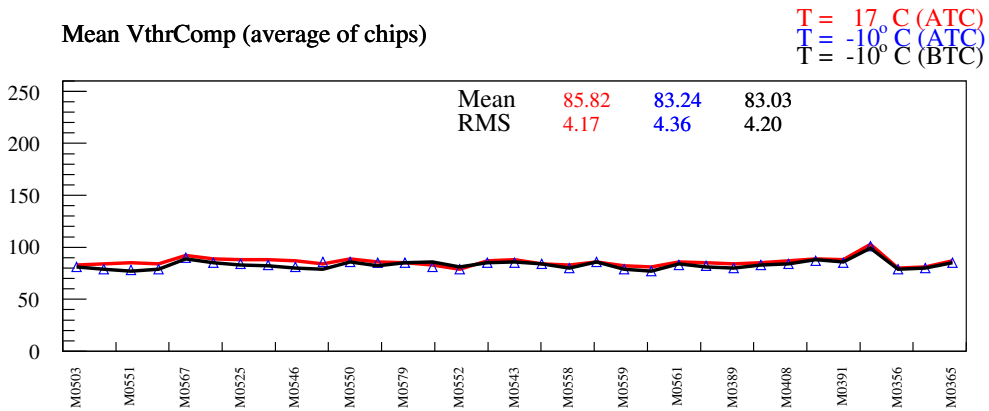
Mean DACs I

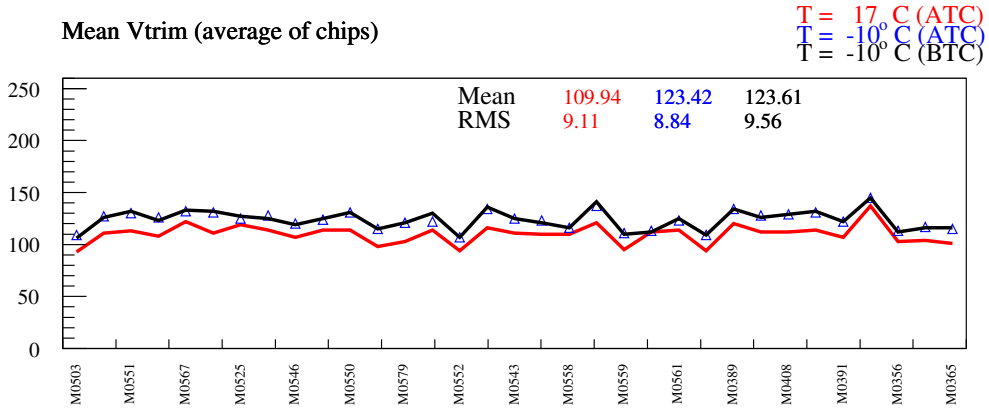




Operational parameters II

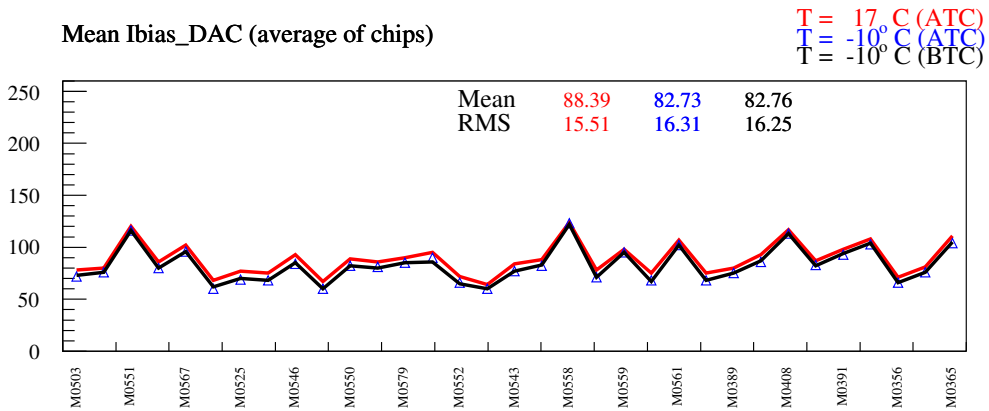
Mean DACs II

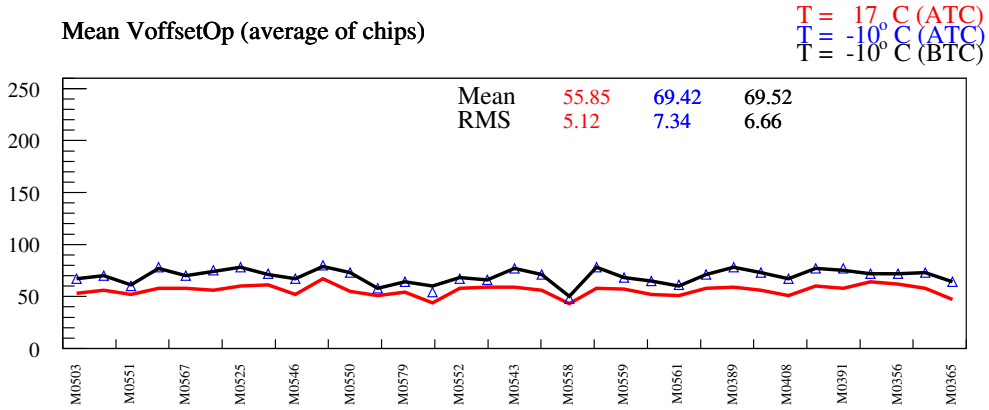




Operational parameters III

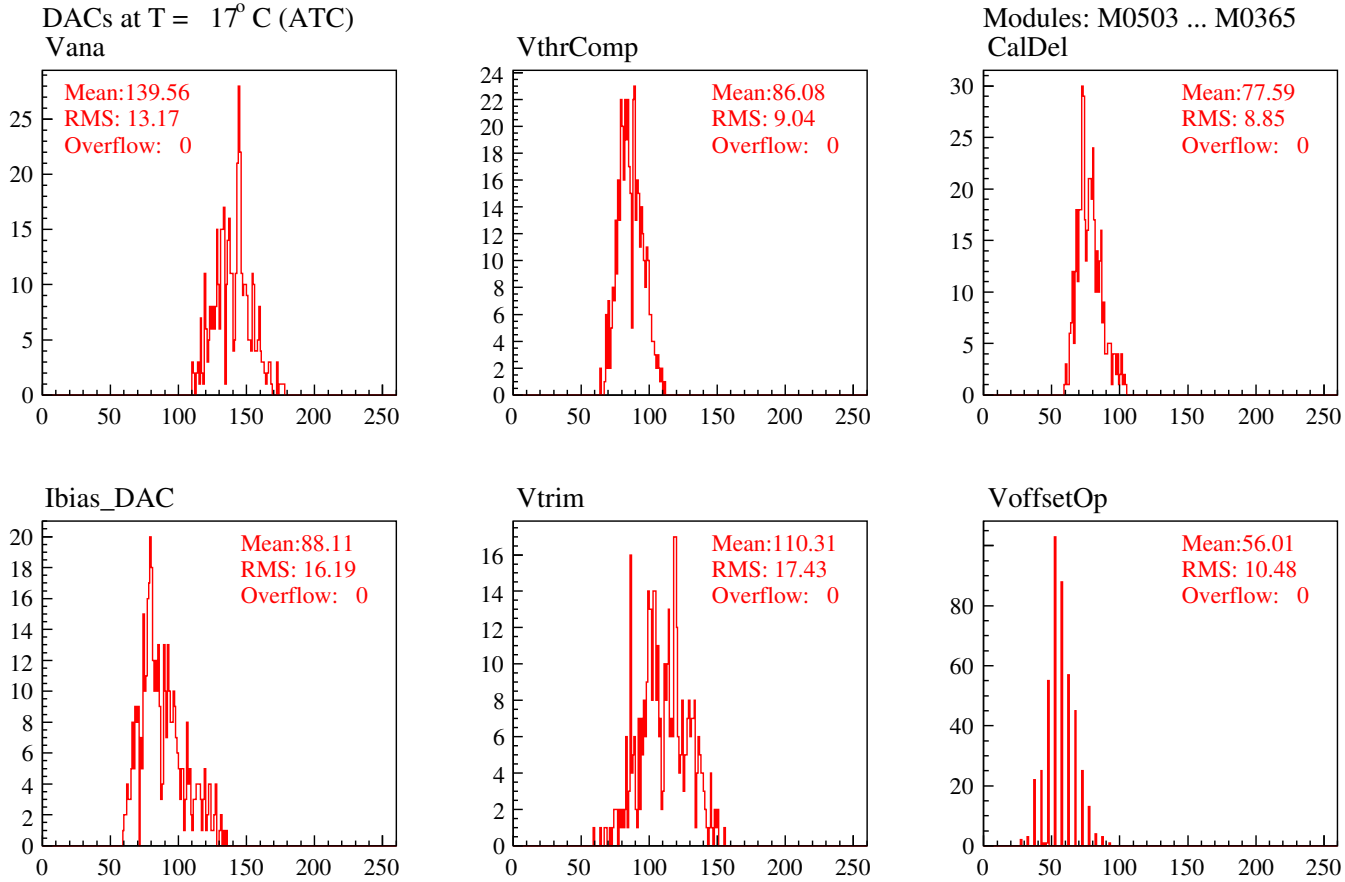
Mean DACs III





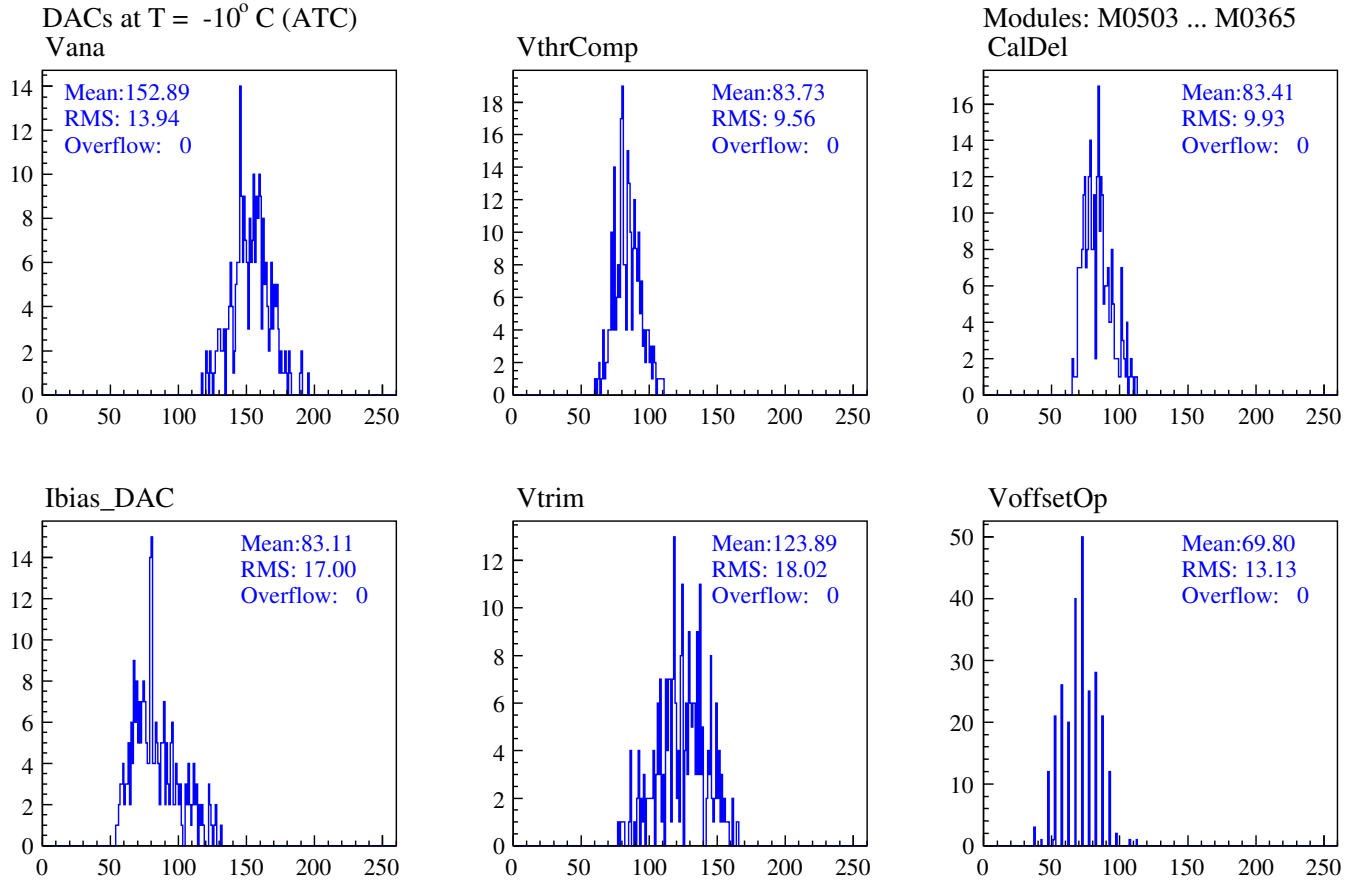
Operational parameters at $T = +17^{o}C$ (ATC)

DAC distribution (of chips)



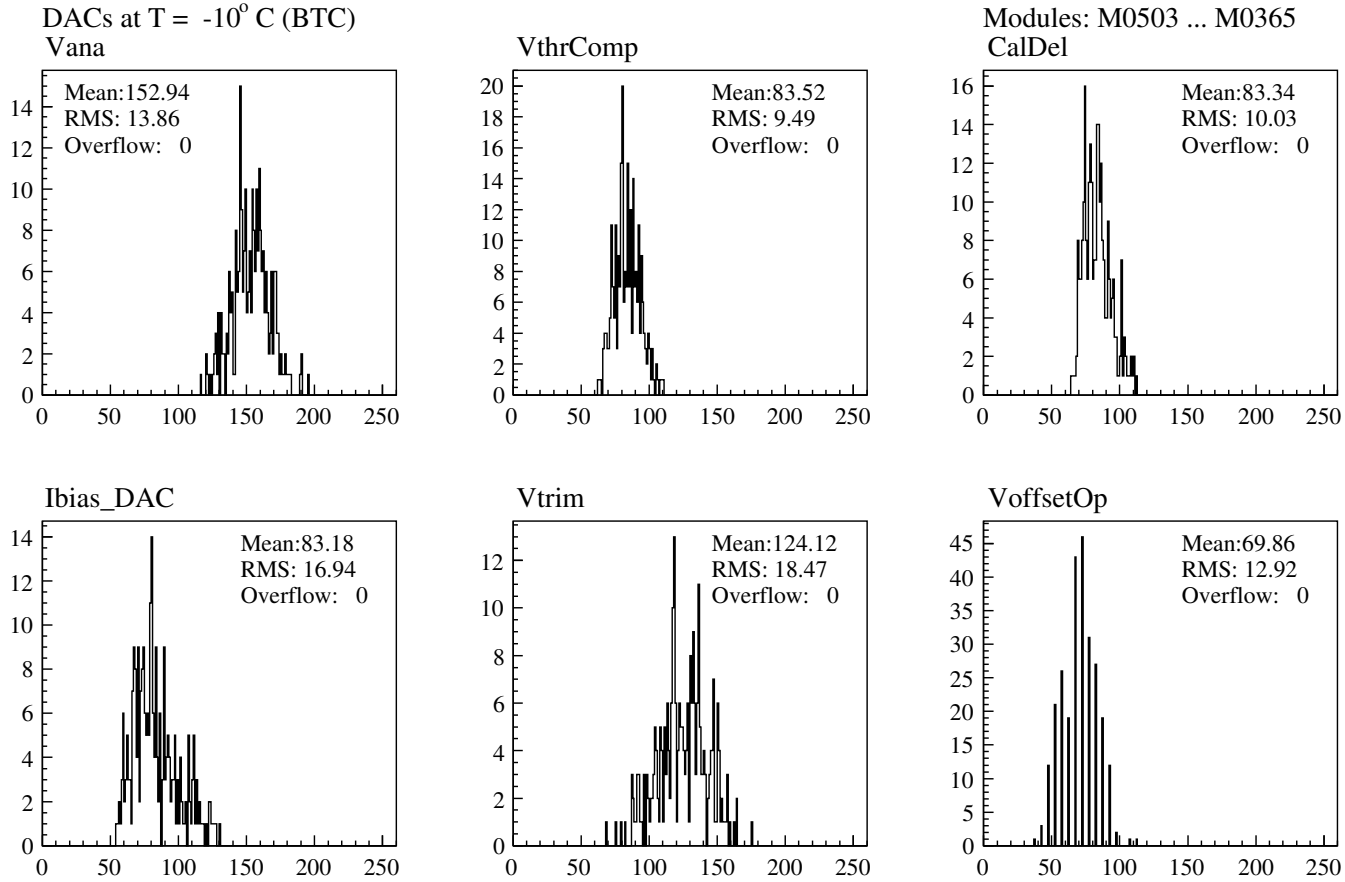
Operational parameters at $T = -10^oC$ (ATC)

DAC distribution (of chips)

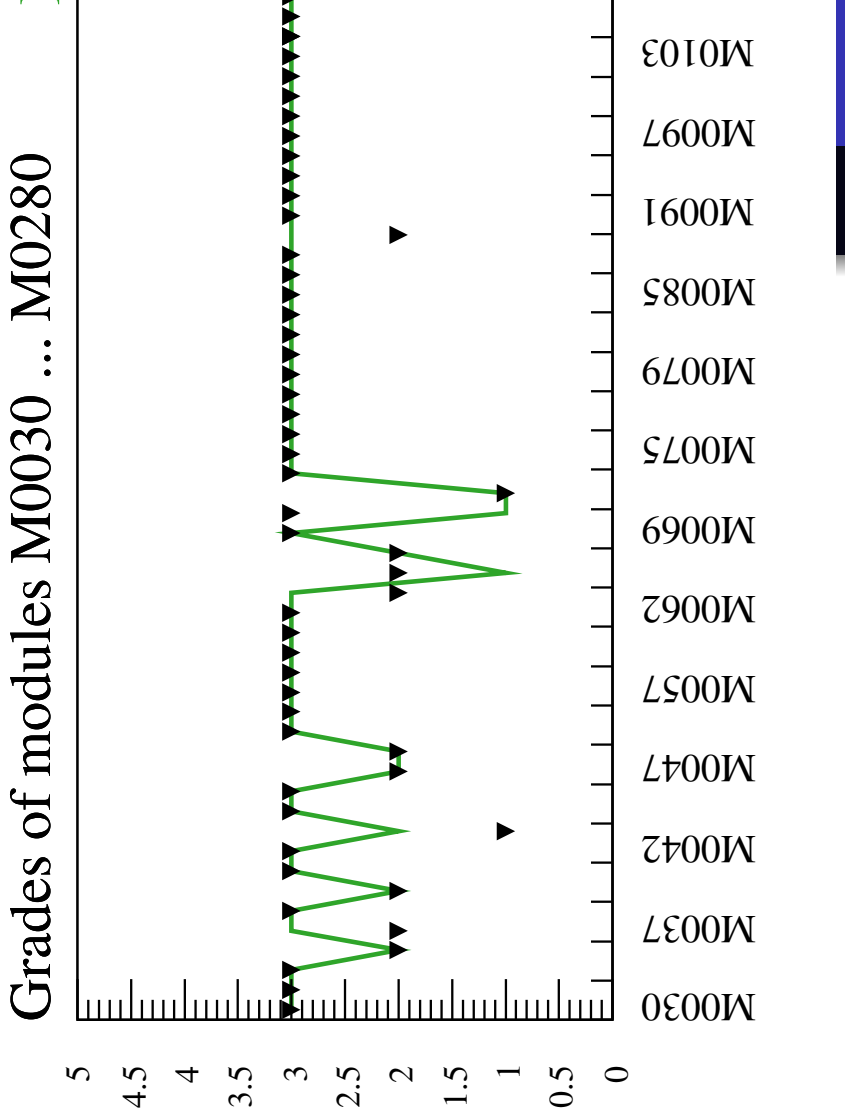


Operational parameters at $T = +17^{o}C$ (BTC)

DAC distribution (of chips)

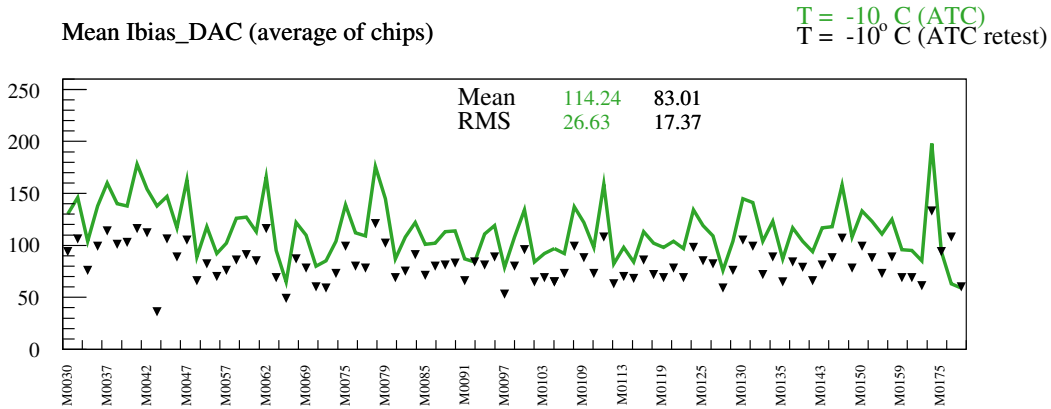


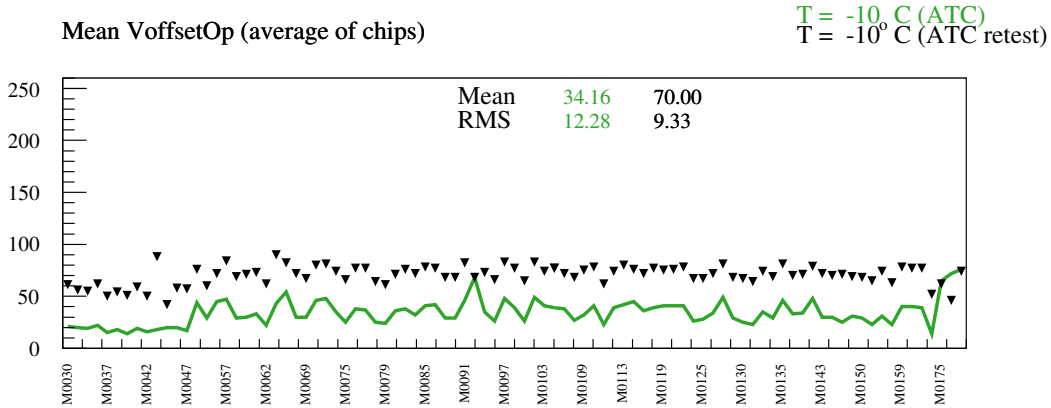
Retest Grades



Operational parameters

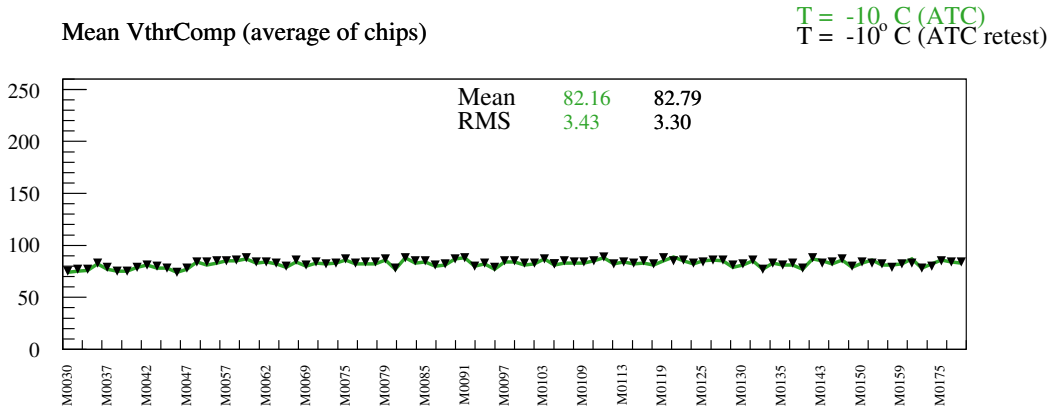
Mean DACs I

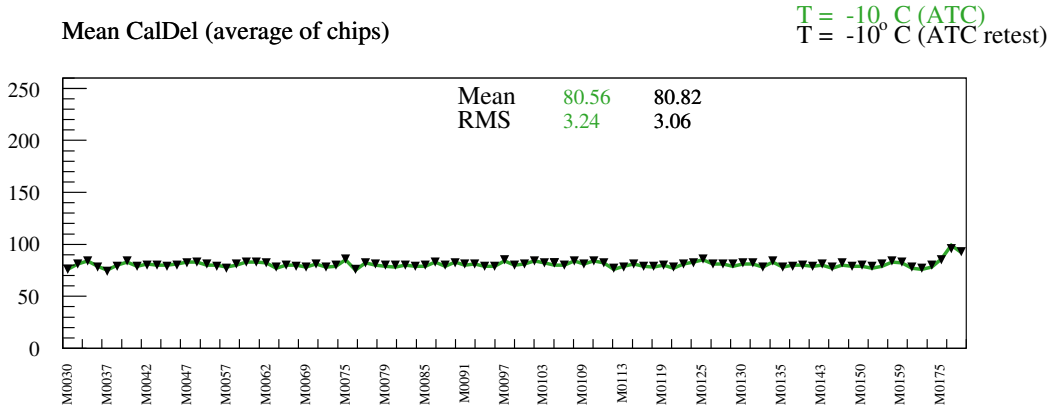




Operational parameters

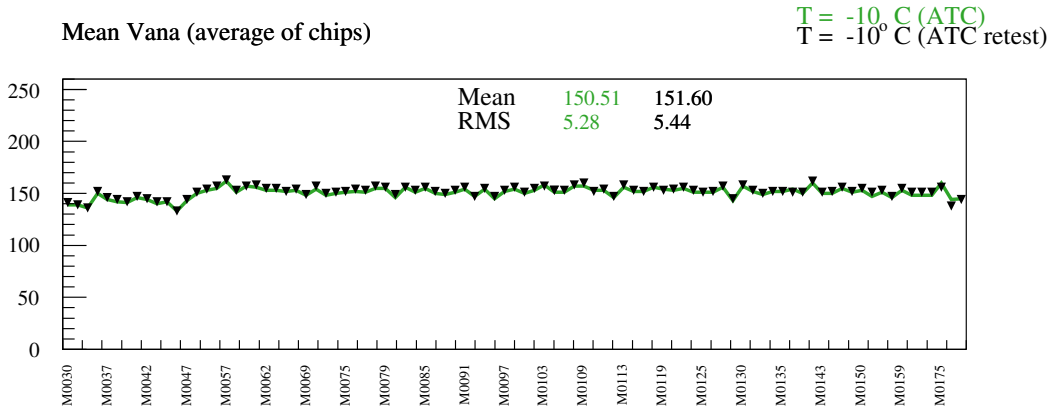
Mean DACs II

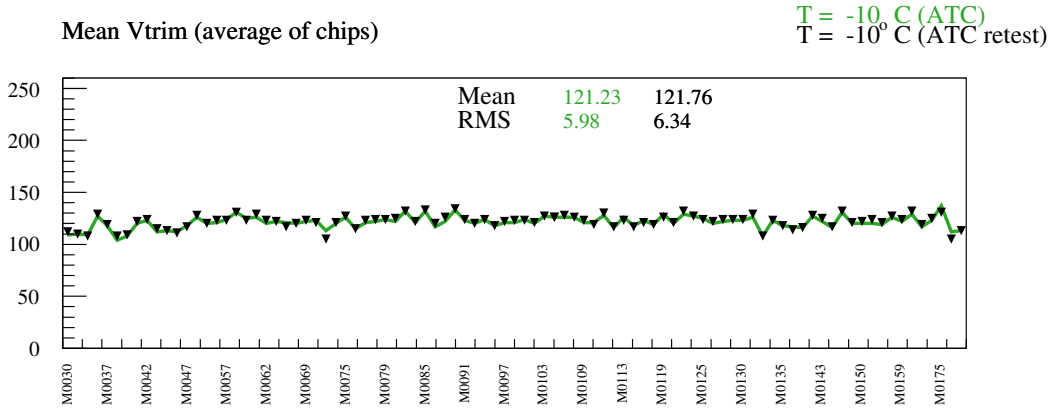




Operational parameters

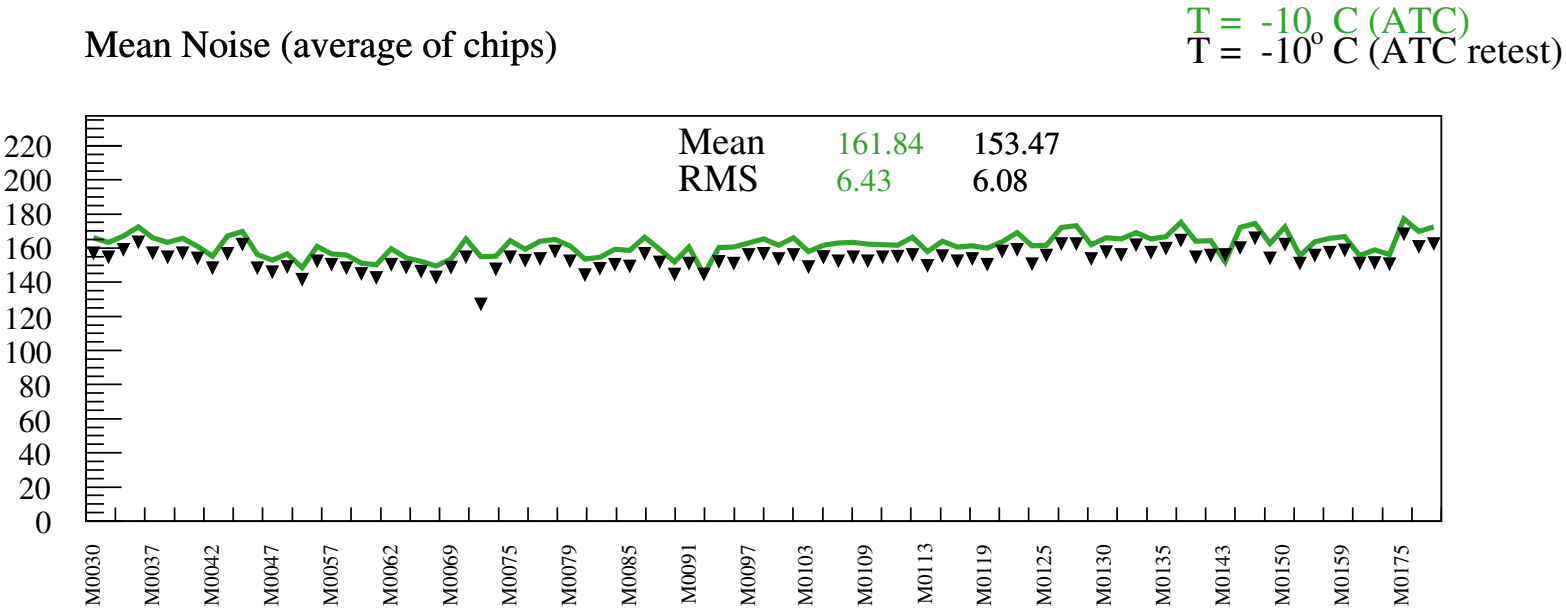
Mean DACs III





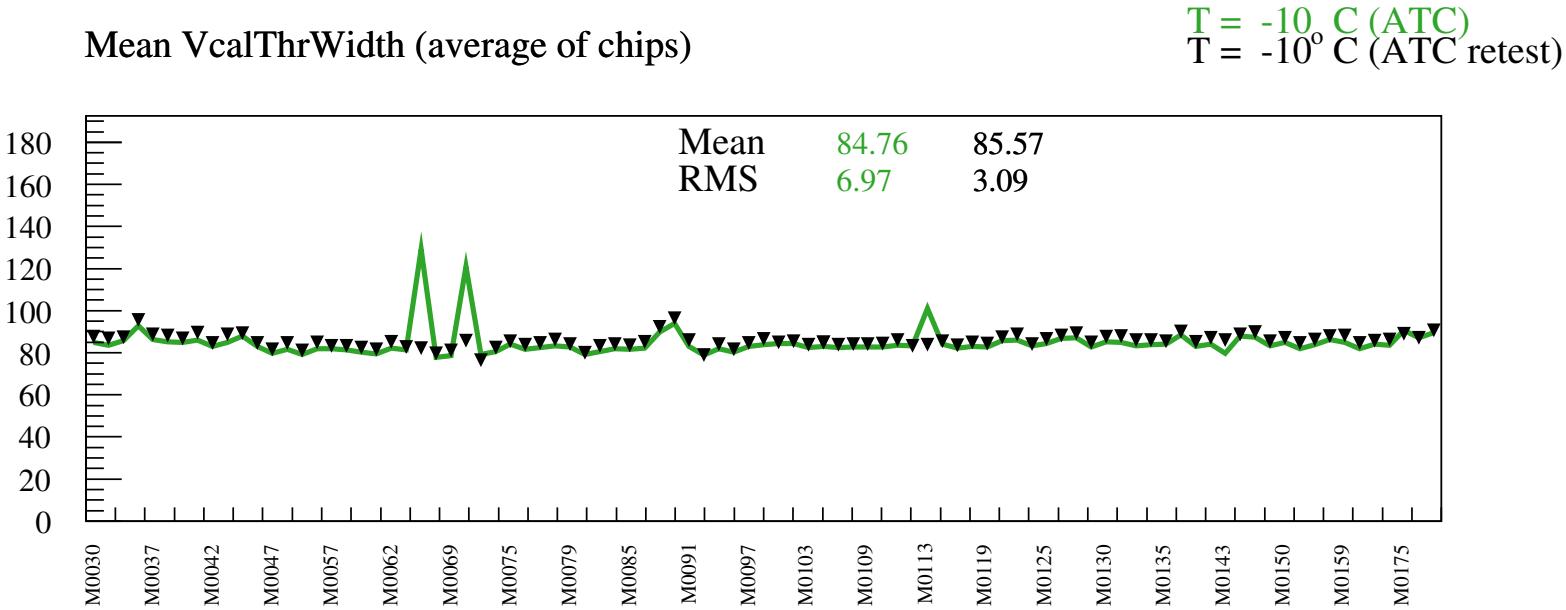
Performance parameters

Mean **Noise** [e^-] vs. Module Nr.



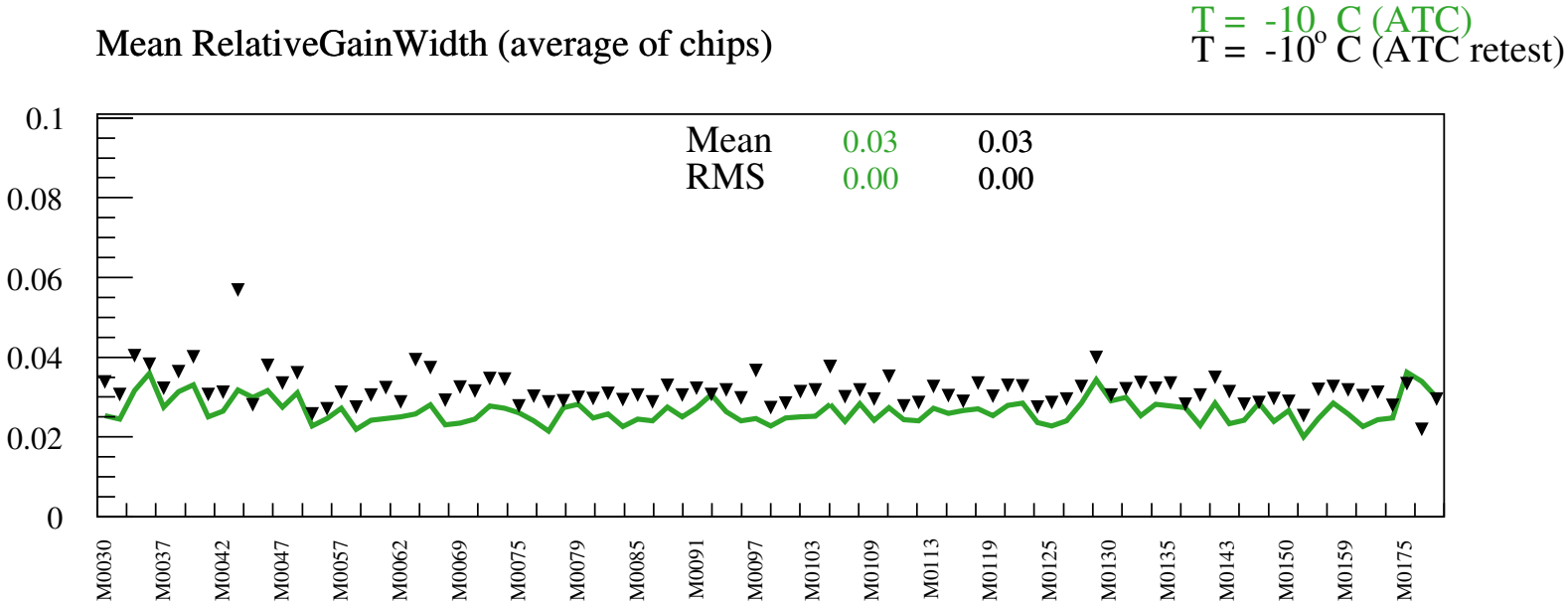
Performance parameters

Mean **VcalThresholdWidth** [e^-] vs. Module Nr.



Performance parameters

Mean **RelativeGainWidth** [%] vs. Module Nr.



Performance parameters

Mean **PedestalSpread** in [e^-] vs. Module Nr.