# BPIX Module Testing Status - week 44

5th January 2007

# Production overview

**Production Status:** 308 modules produced

- 213/40 graded as A/B $\rightarrow$ 82%
- 55 graded as C $\rightarrow$ 18%

**Testing Status of week 44:**

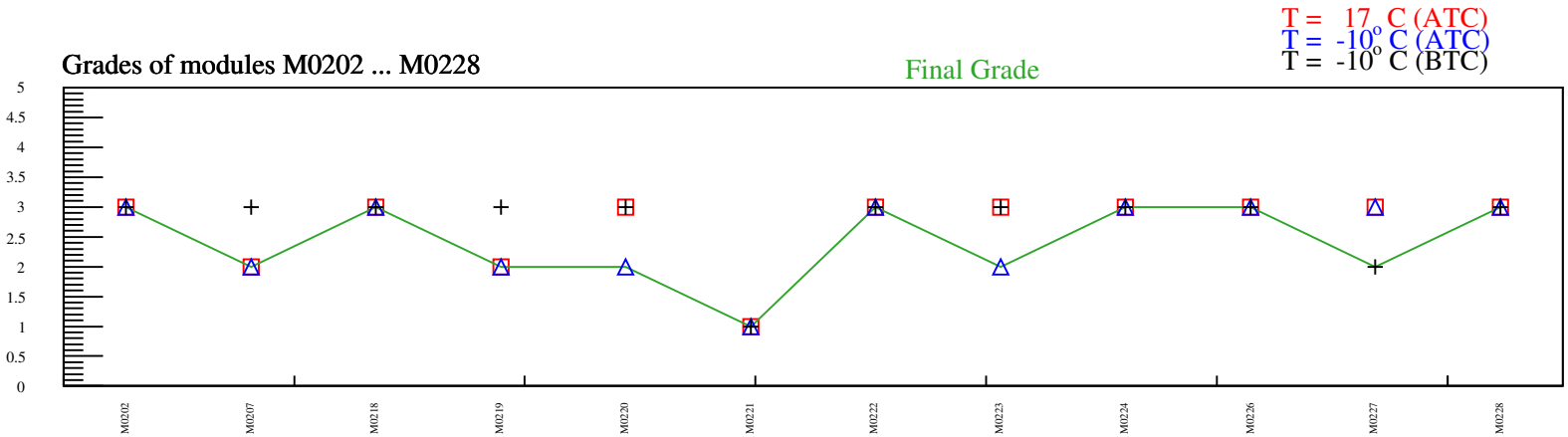
- 12 modules fully tested and therm. cycled

| **Grade** | **A** | **B** | **C** |
|---|---|---|---|
| T = $-10^o$ C, BTC* | 10 | 1 | 1 |
| T = $-10^o$ C, ATC | 7 | 4 | 1 |
| T = $+17^o$ C, ATC | 9 | 2 | 1 |
| **Final Grade** | 6 | 5 | 1 |

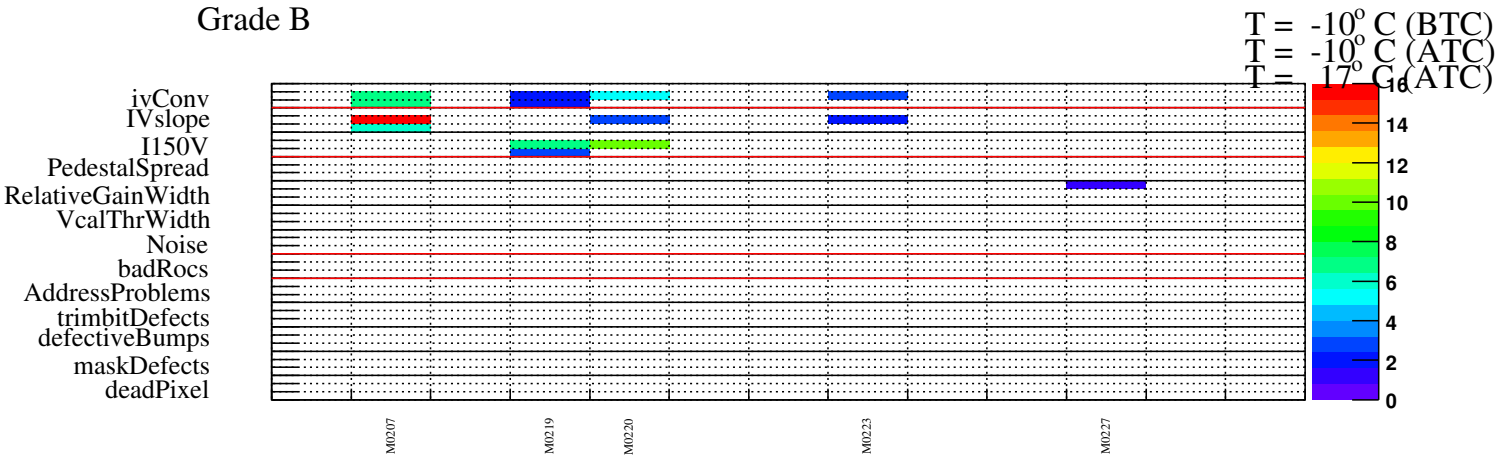
- 2 partially tested / testing failed
- 4 were retested (nothing changed)

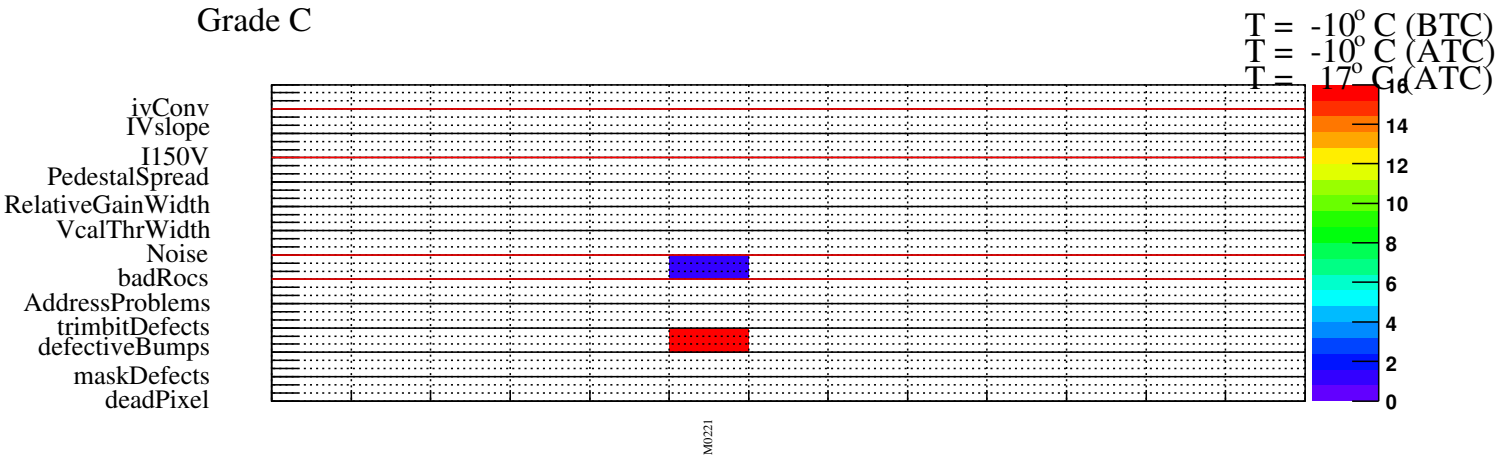
*without IV-criteria

# Production summary



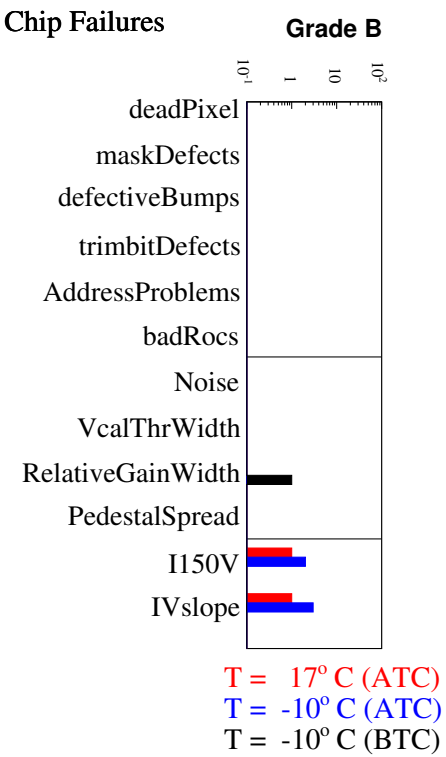
# Module Failures Overview



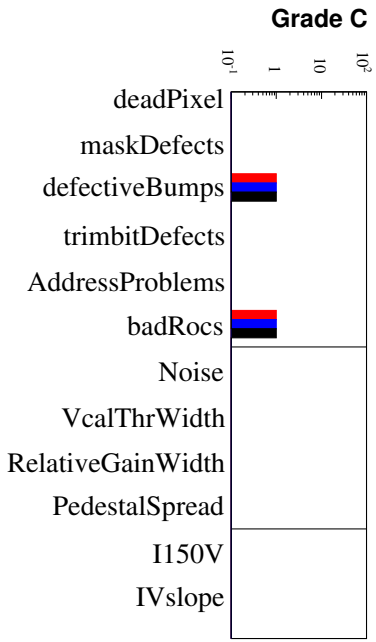



# Production quality

## Grade B




## Grade C Failures




← Pixel defects

← Chip performance

← Module IV

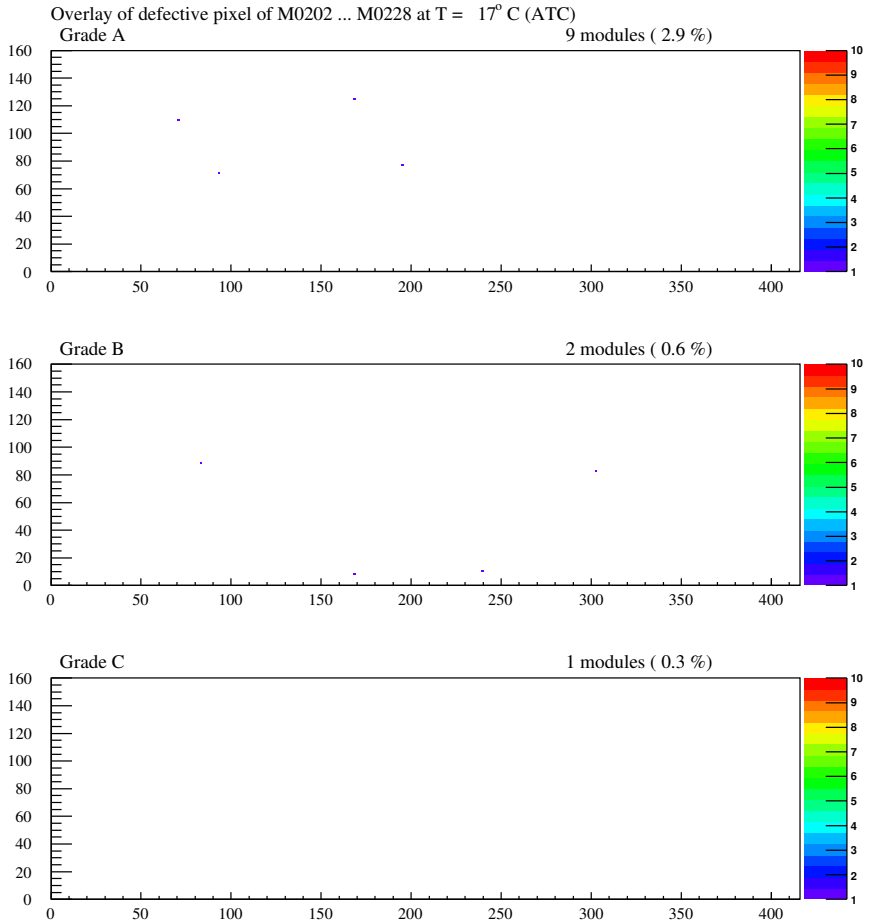
# Defective pixel $T = 17^oC$ (ATC)

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

Grade A
(9 modules)

Grade B
(2 modules)

Grade C
(1 modules)



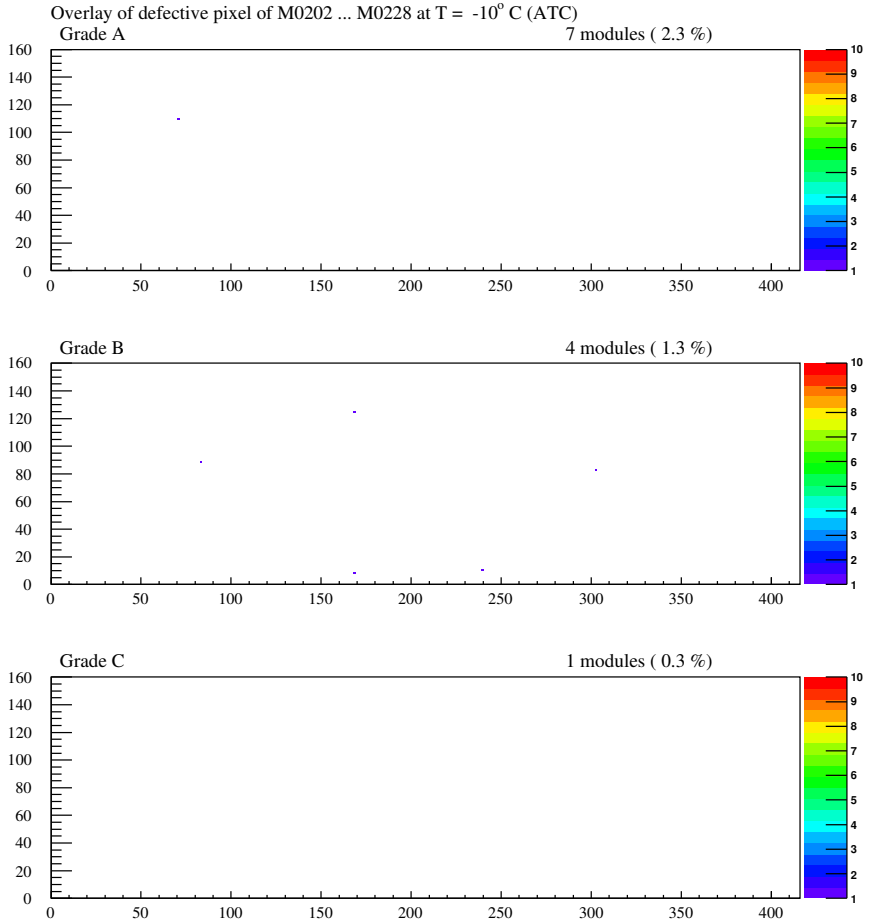
# Defective pixel $T = -10^{o}C$ (ATC)

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

Grade A
(7 modules)

Grade B
(4 modules)

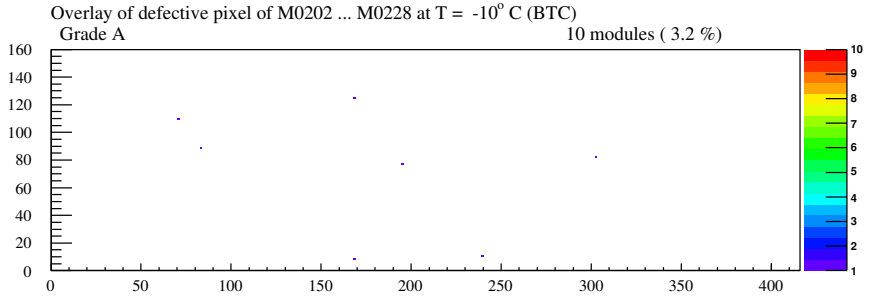
Grade C
(1 modules)



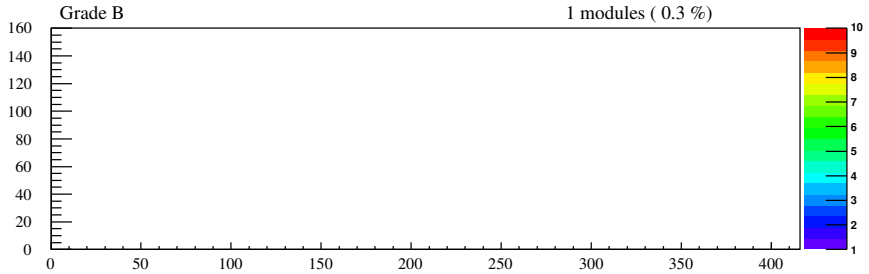
# Defective pixel $T = -10^{o}C$ (BTC)

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

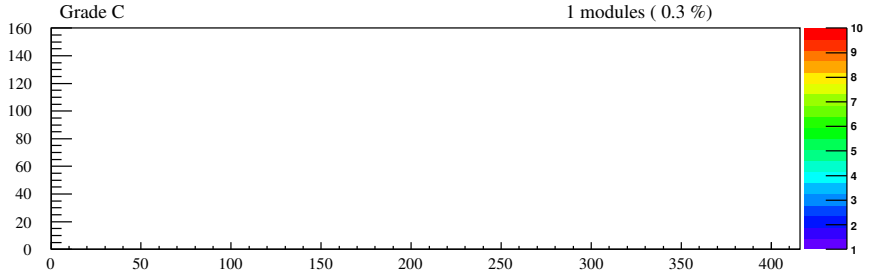
Grade A
(10 modules)




Grade B
(1 modules)




Grade C
(1 modules)



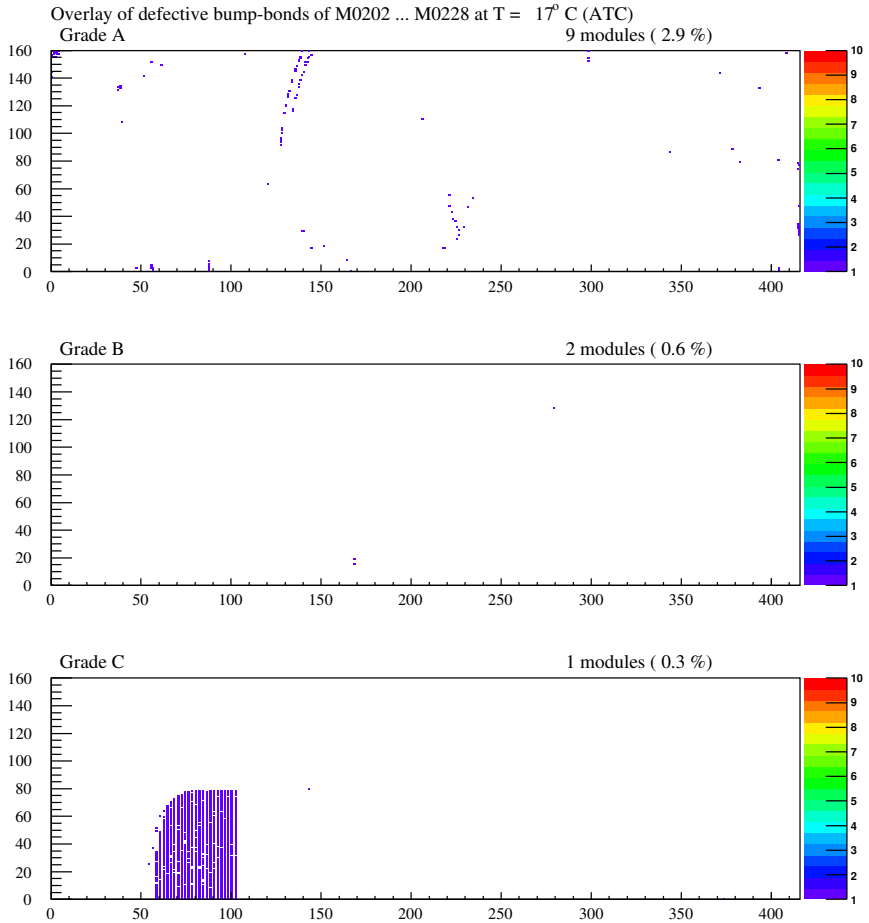
# Defective bump-bonds $T = 17^{o}C$ (ATC)

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

Grade A
(9 modules)

Grade B
(2 modules)

Grade C
(1 modules)



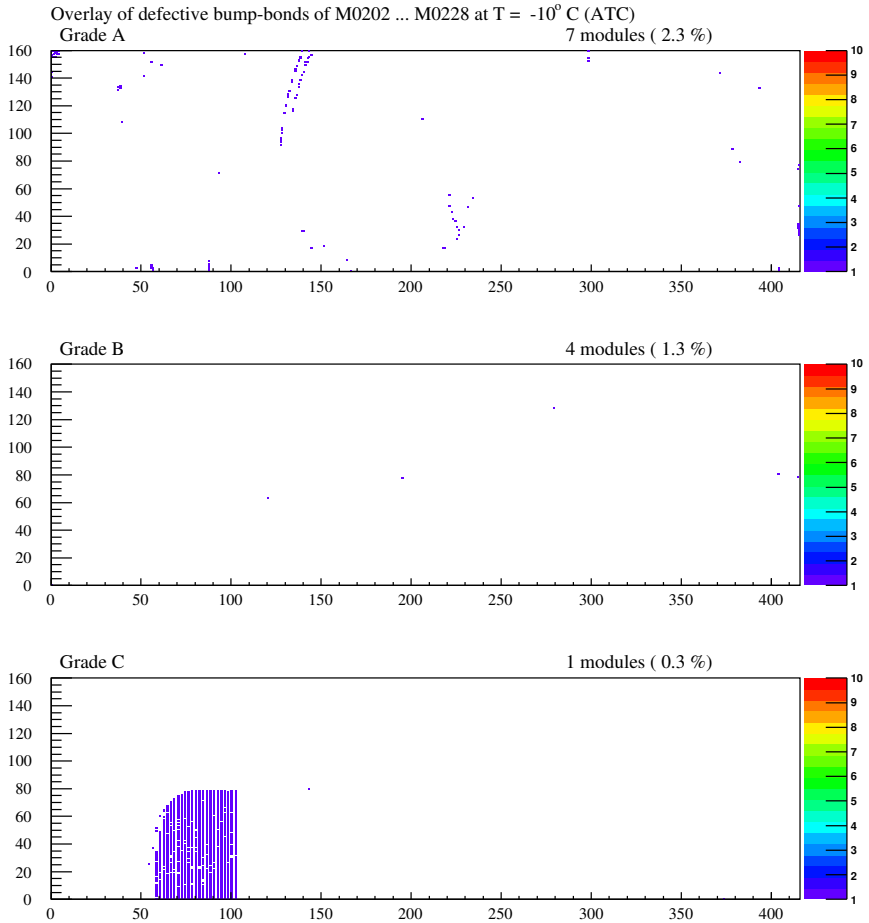
# Defective bump-bonds $T = -10^{o}C$ (ATC)

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

Grade A
(7 modules)

Grade B
(4 modules)

Grade C
(1 modules)



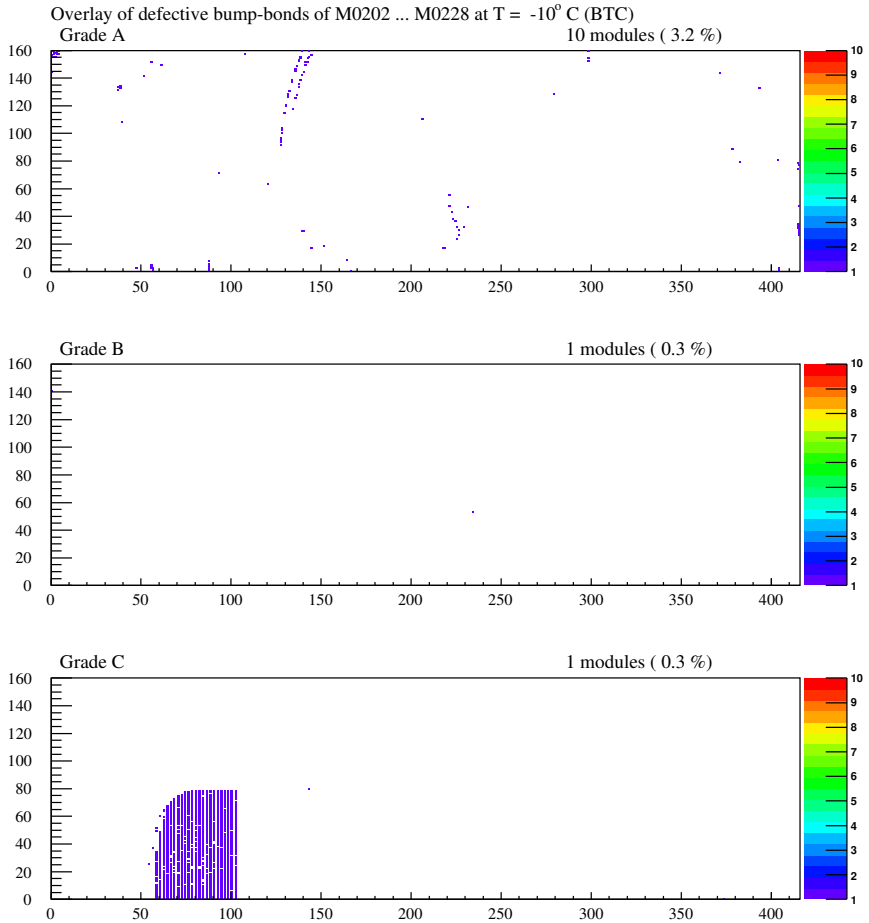
# Defective bump-bonds $T = -10^{o}C$ (BTC)

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

Grade A
(10 modules)

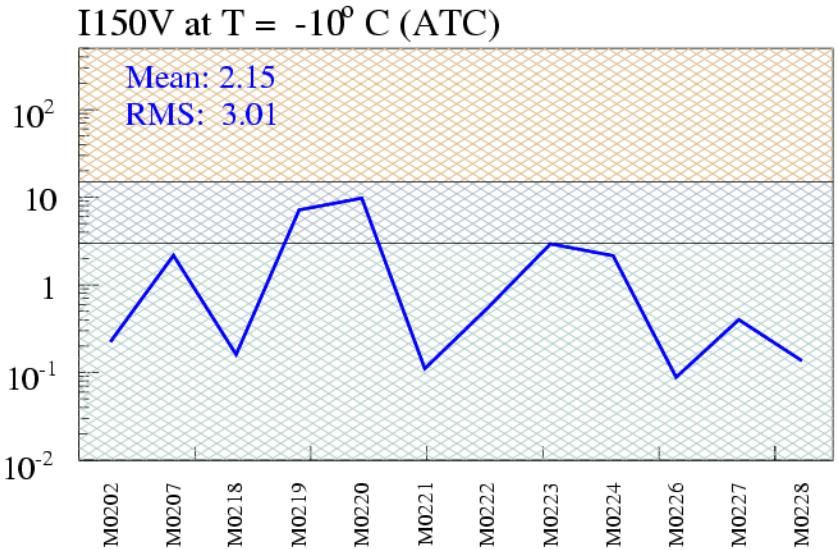
Grade B
(1 modules)

Grade C
(1 modules)

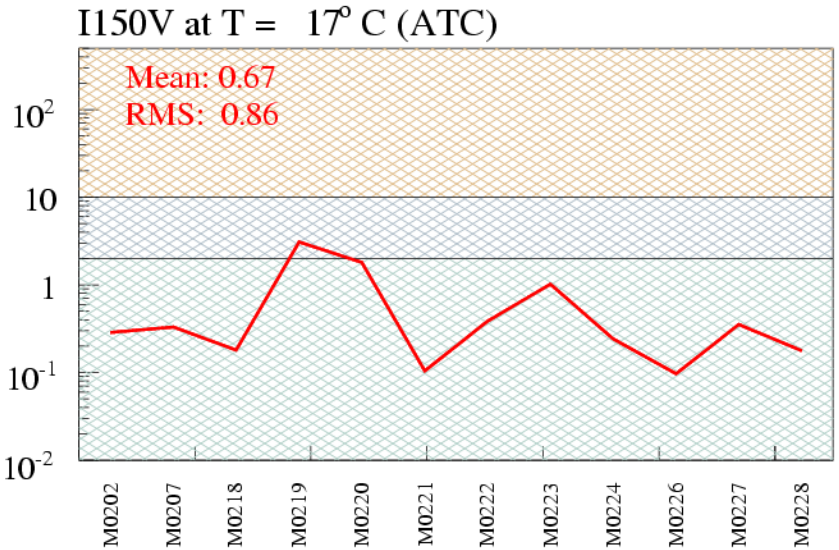


# Current at 150 V

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



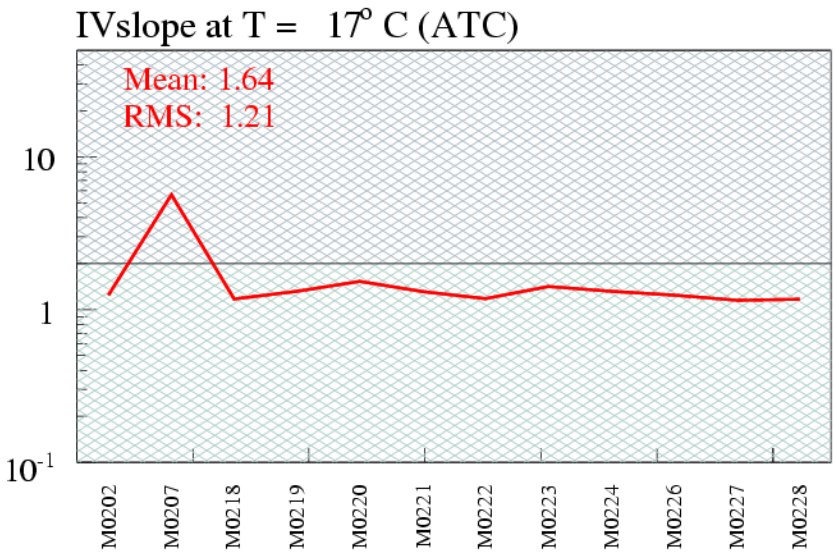

recalculated

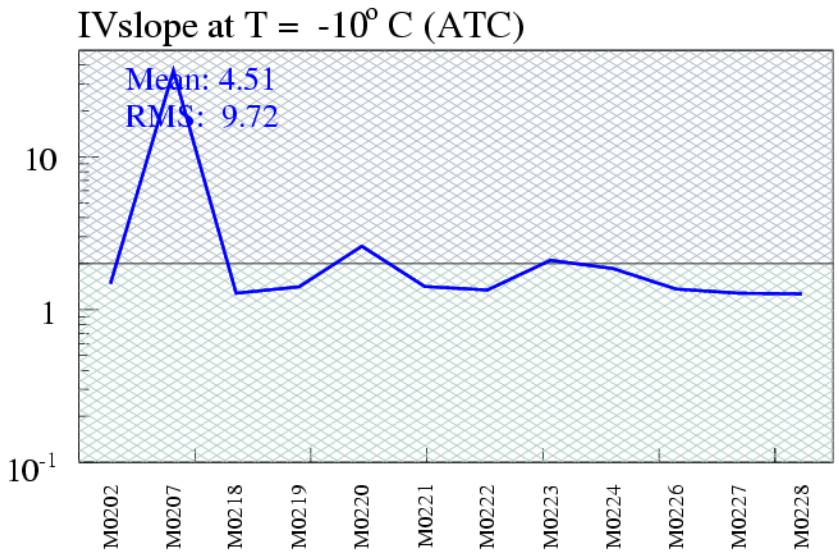



measured

# Slope of IV-Curve

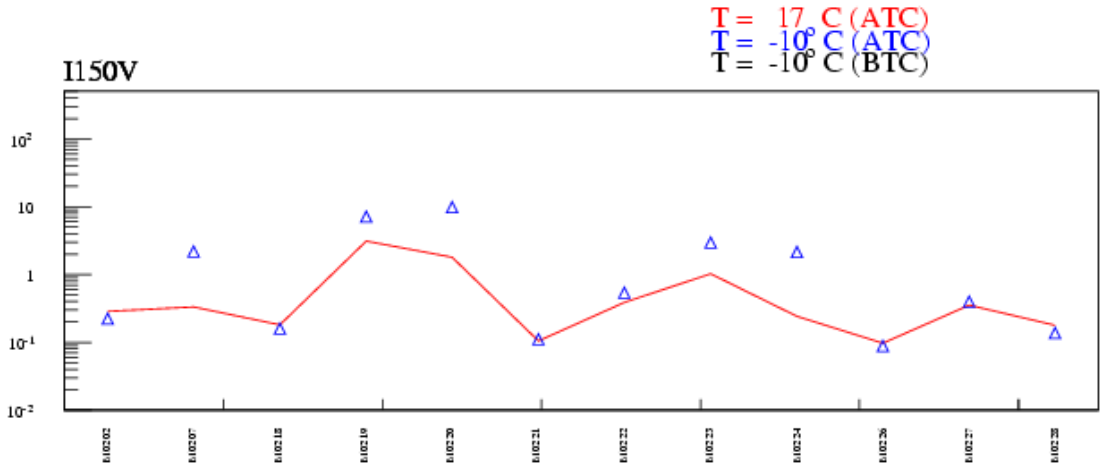
Slope of IV-Curveat $T = 17^oC$ and $T = -10^oC$

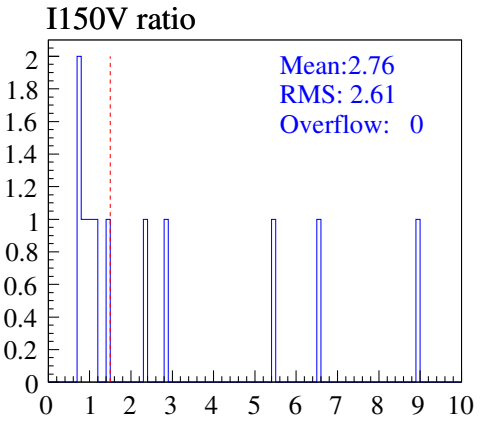


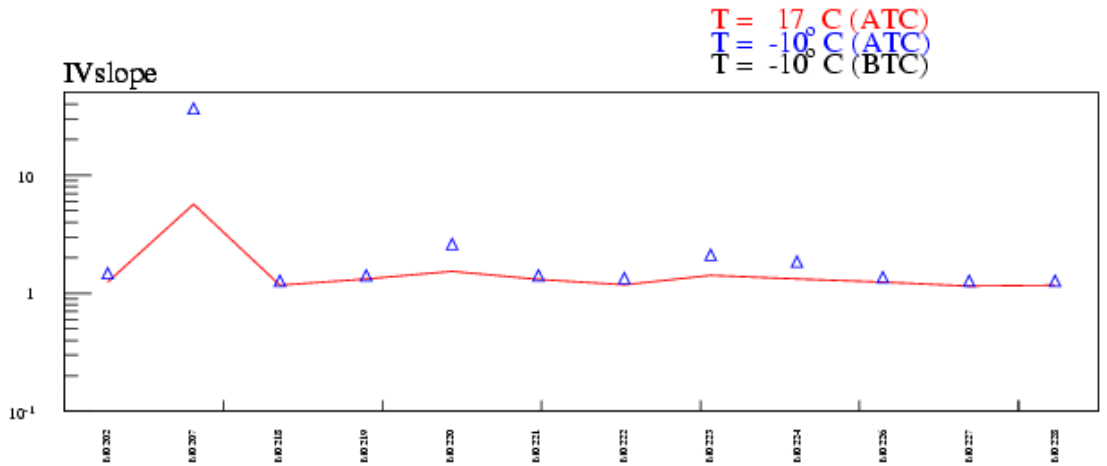



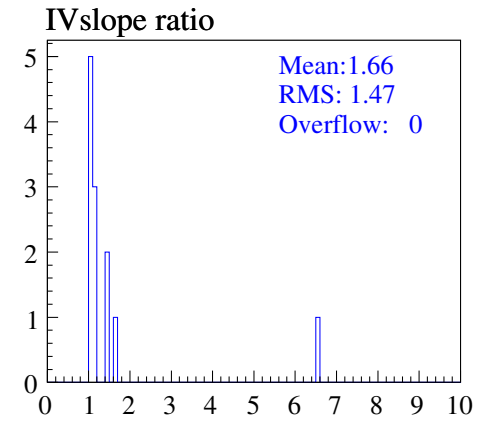
# Current recalculation to $T = 17^oC$

## Cross check of recalculated values with measured values

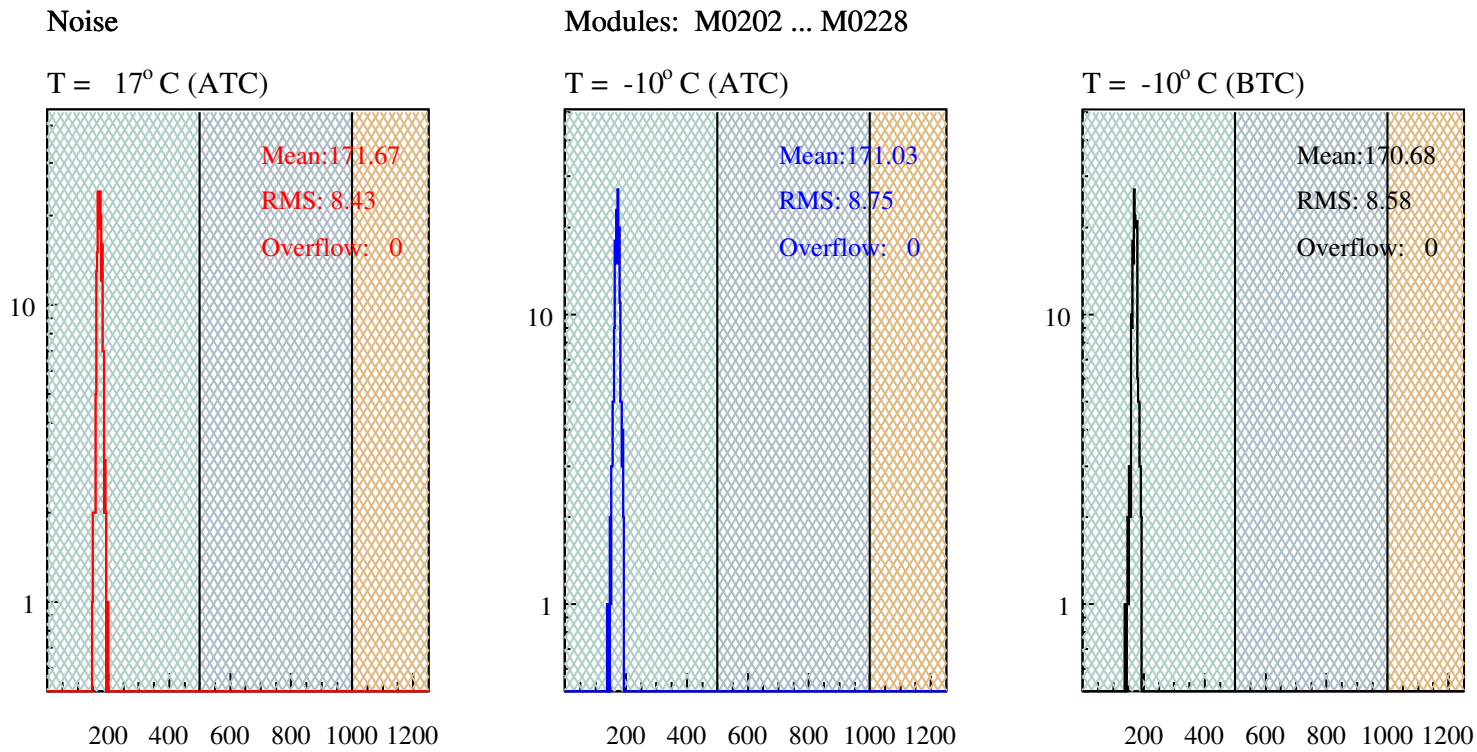


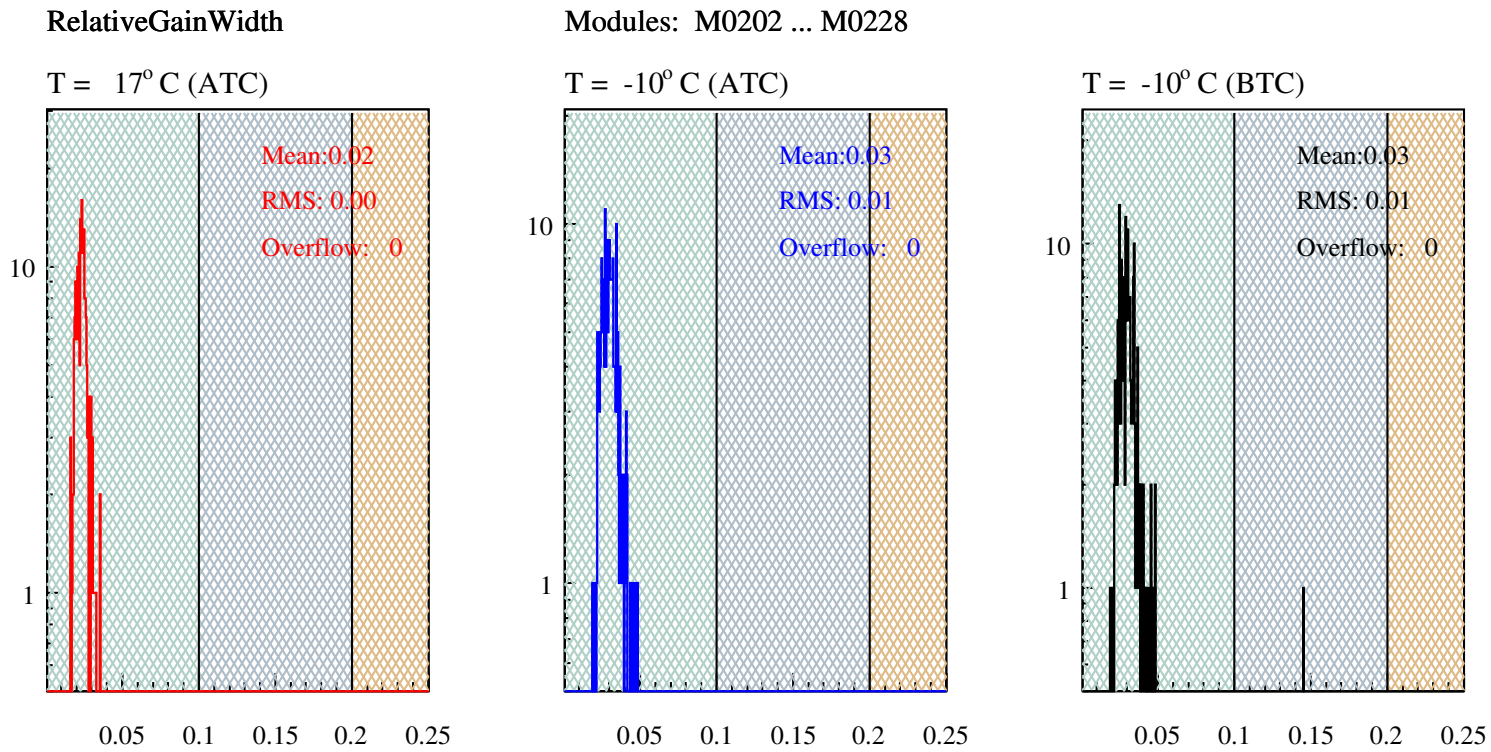



## **MeanNoise** of chips



# Relative Gain Width

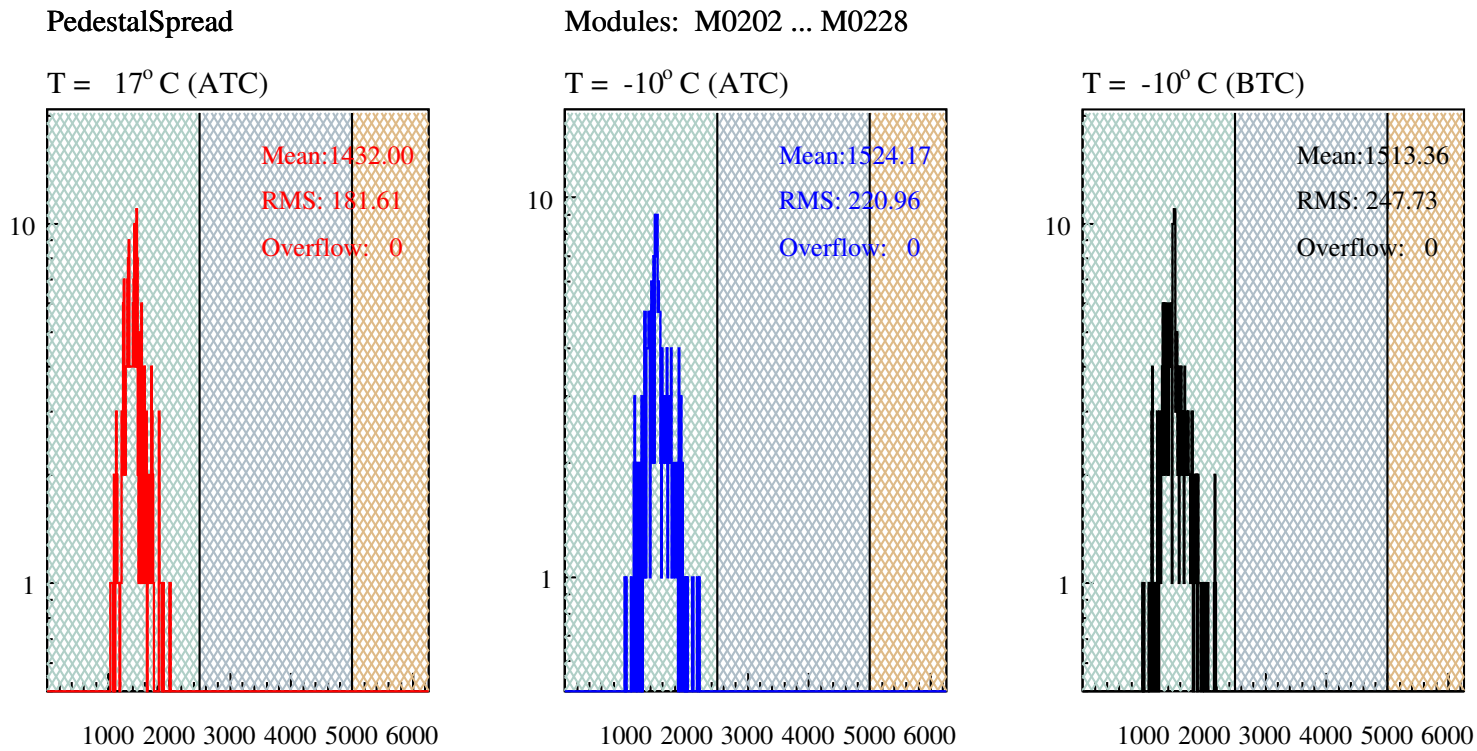
## **RelativeGainWidth** of chips




Rel. Gain Width in %

# Pedestal Spread

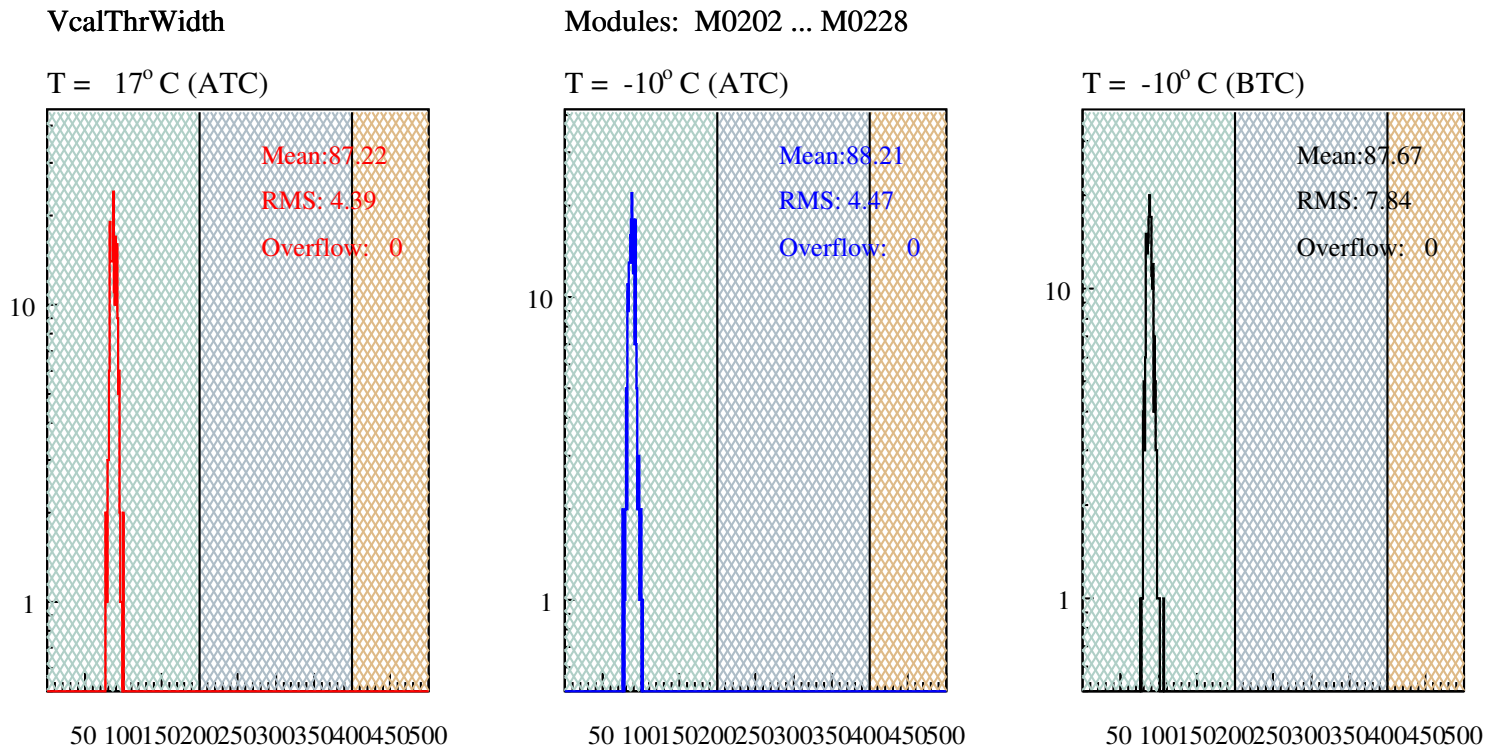
## **PedestalSpread** of chips




Pedestal Spread in $e^-$

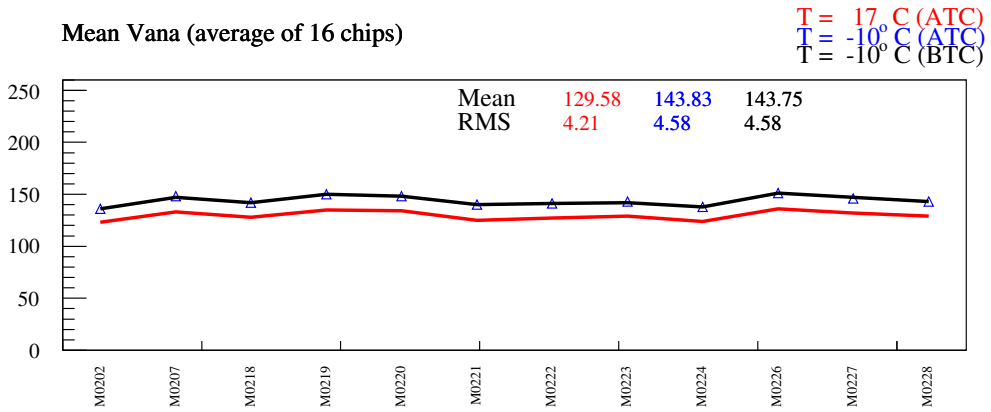
# Vcal Threshold Width

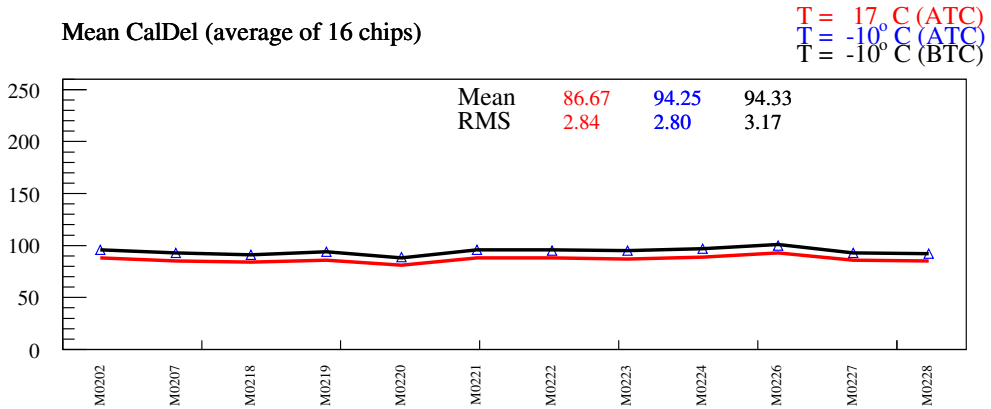
## **VcalThresholdWidth** of chips



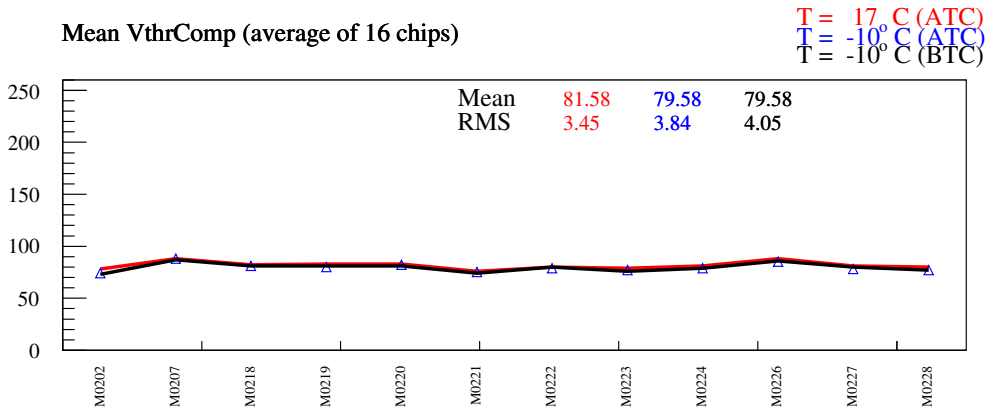
# Operational parameters I

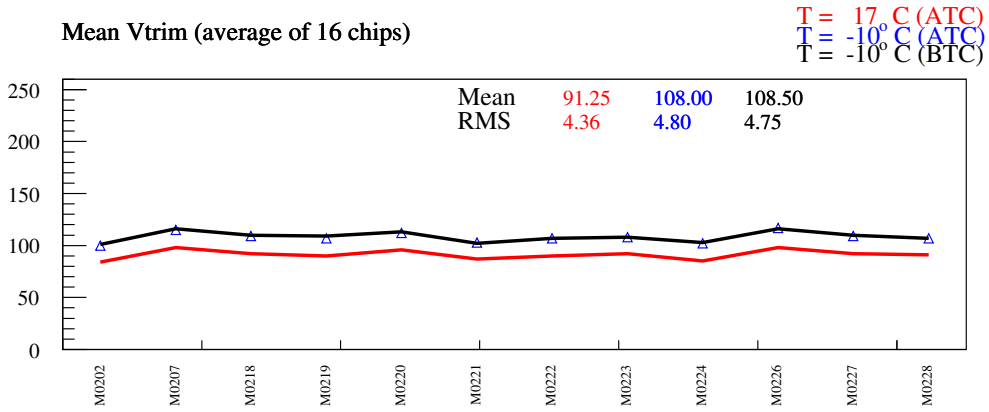
## Mean DACs I



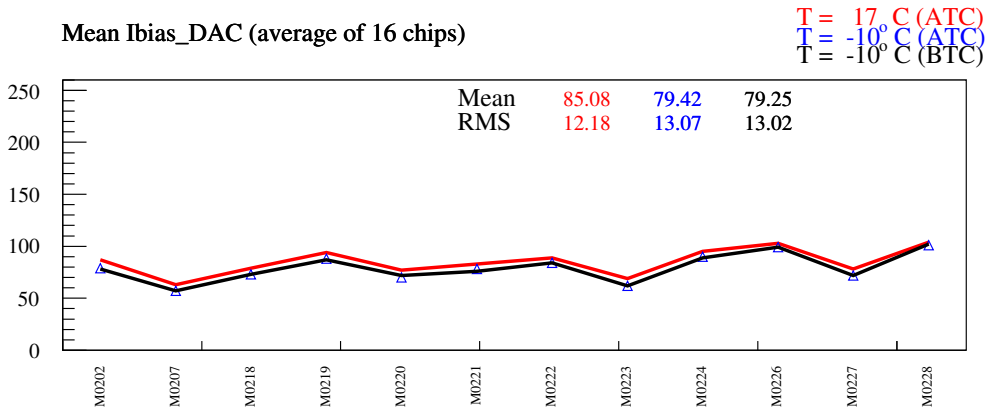
## Mean DACs II

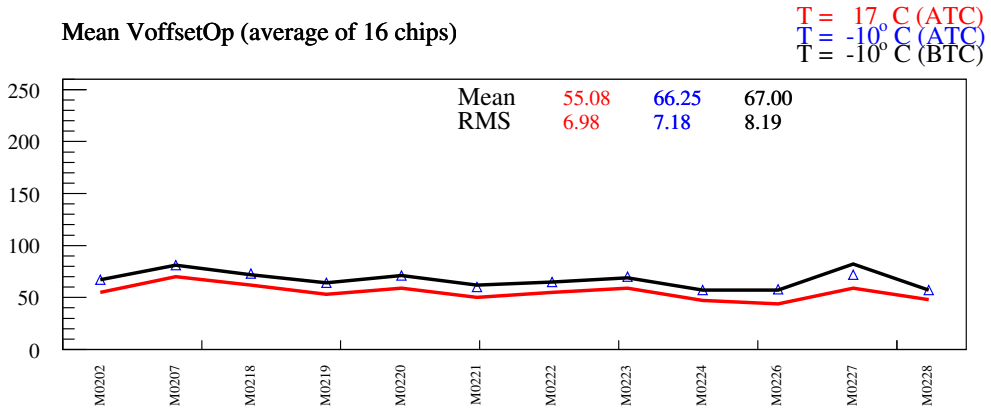

Mean VthrComp (average of 16 chips)
T = 17 C (ATC)
T = -10° C (ATC)
T = -10° C (BTC)
Mean 81.58 79.58 79.58
RMS 3.45 3.84 4.05
250
200
150
100
50
0
M0202
M0207
M0218
M0219
M0220
M0221
M0222
M0223
M0224
M0226
M0227
M0228


Mean Vtrim (average of 16 chips)
T = 17 C (ATC)
T = -10° C (ATC)
T = -10° C (BTC)
Mean 91.25 108.00 108.50
RMS 4.36 4.80 4.75
250
200
150
100
50
0
M0202
M0207
M0218
M0219
M0220
M0221
M0222
M0223
M0224
M0226
M0227
M0228

# Operational parameters III

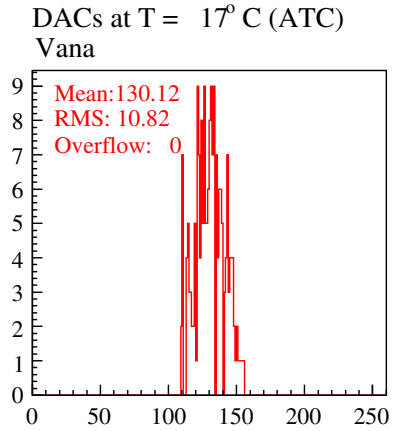
## Mean DACs III

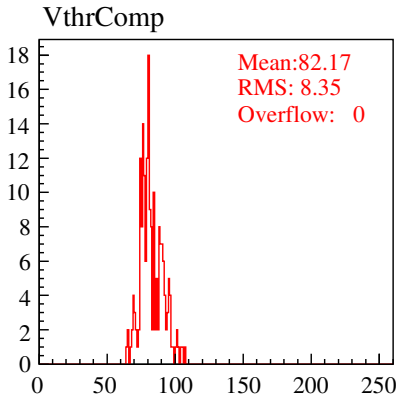


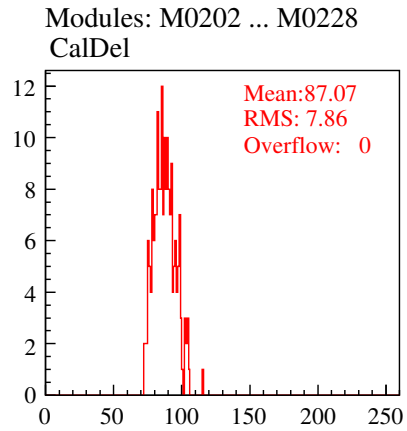



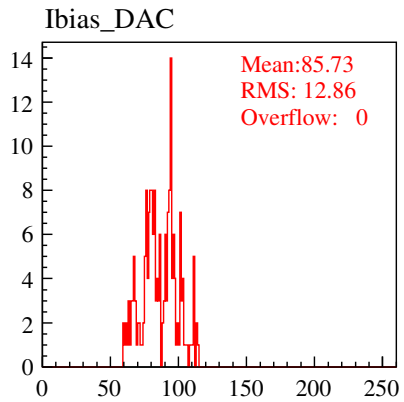
# Operational parameters at $T = +17^{o}C$ (ATC)

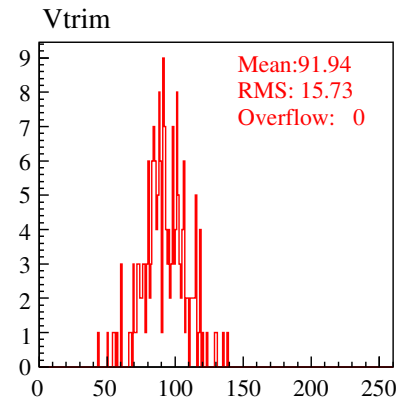
## DAC distribution (of chips)

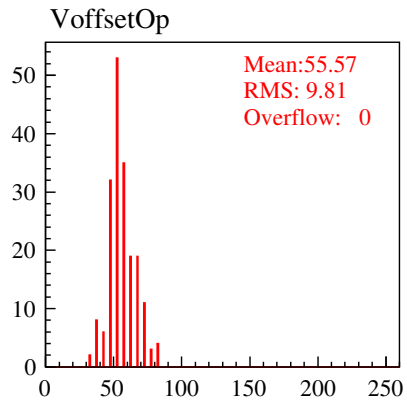


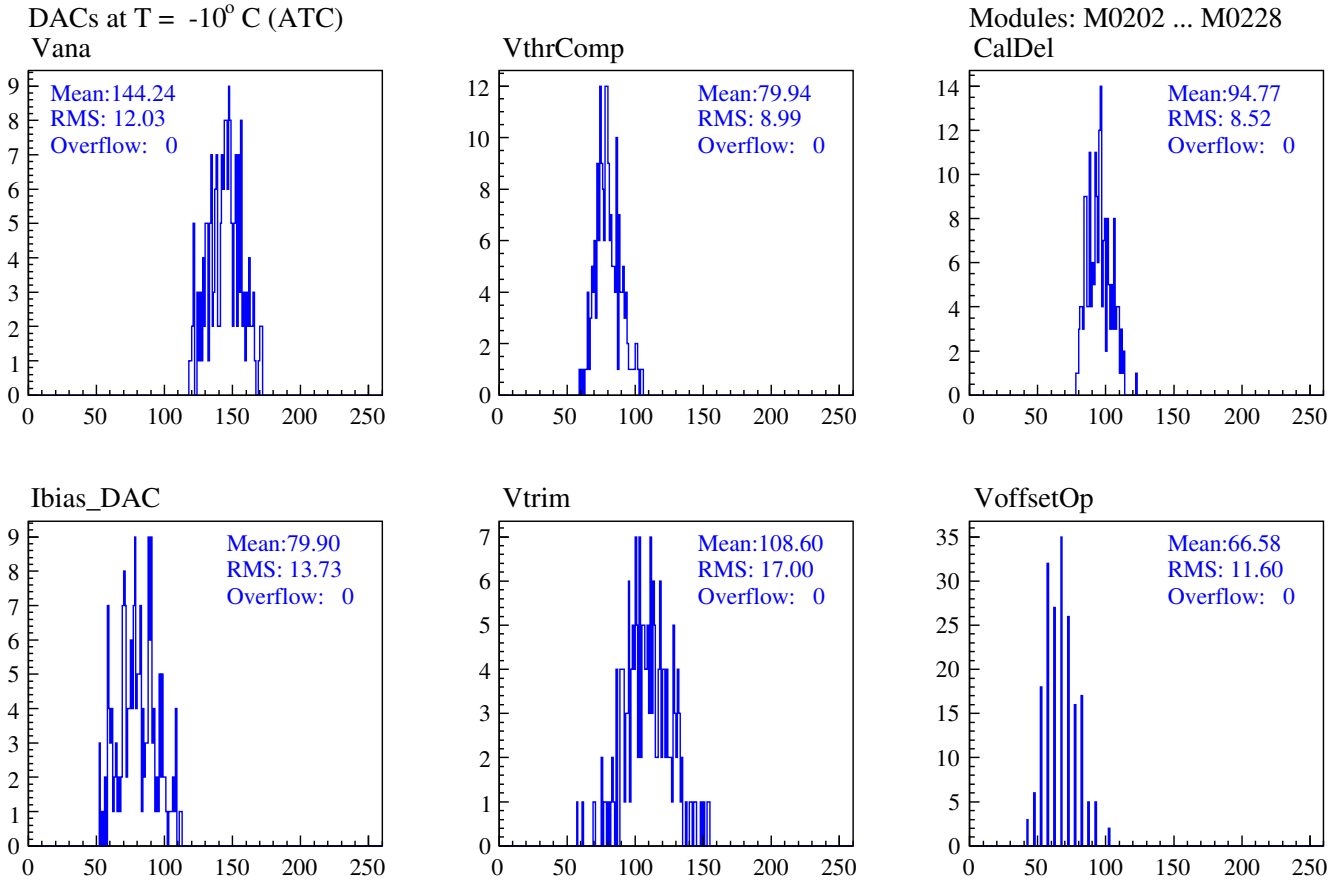



# Operational parameters at $T = -10^{o}C$ (ATC)

## DAC distribution (of chips)



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

## DAC distribution (of chips)