Modules & characterization

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Setup description

- S3B board 10 (Mod10) S3B power supply box 22.
- High voltage for the back plane as well as the 5V for the S3B board were supplied externally, from the Toellner power supply.

- Read out sequence CCG NZS 14d 128 sw3.csv
- The software version used for the characterization was the old one with the 8 rows shift bug still present.
- Matrices were exposed to the Cadmium Cd109 (≃90MBq).
- ~ 3000 events in the online Monitor was recorded for every measurement.
- Set of standard voltages have been applied to all matrices (see report).
- The optimization using a SNR(Cd109 peak).
- Procedure:
  - Initial scan in the 2d parameter space of ClearLow and CCG.
  - For this optimal point scan over GateON voltage.
- For the chosen best operating point a long (high statistics) run was performed.

Modules

Hybrid ID	Wafer ID	Chip ID	Type	Comment
H 3.0.01	92	J12	C3G L A	6 dead rows, working fine DUT module
H 3.0.04	90	G11	COCG S E	working fine DUT module
H 3.0.06	91	G08	COCG L B	working fine exept one hotspot, telescope module
H 3.0.07	90	H09	COCG V S	20x20m, excellent DUT module
H 3.0.08	90	G08	COCG L B	gate on voltage not stable, dead rows and dead columns
H 3.0.09	91	B02	COCG L B	2 Ch/Curo dead, enhanced current to source and Analog CURO
H 3.0.10	91	J10	COCG L B	Good module, one dead column, telescope module
H 3.0.11	90	M12	COCG L B	Excellent module, telescope module
H 3.0.12	92	B02	COCG L B	Excellent module, telescope module
H 3.0.13	92	D14	C3G L A	Many hot spots, Current in Gate high source current, very bad mounting of a matrix
H 3.0.14	93	M08	COCG L E	Clear-source current, high source current very bad mounting of a matrix
H 3.0.15	92	K11	C3G L A	Many noisy pixels
H 3.0.16	92	G08	COCG L B	Excellent module, telescope module
H 3.0.17	92	H13	COCG L E	Technology related problems not good matrix
H 3.0.18	92	C11	COCG L B DG 5	Dead

Hybrid H 3.0.01 was studied in Munich only after the TB period.

Hybrids H3.0.04 and H3.0.07 have been selected for DUTs,

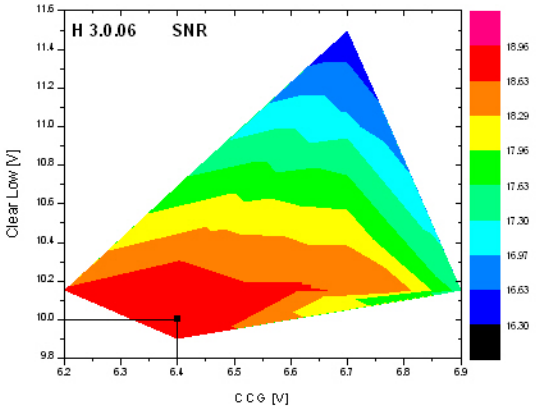
H3.0.06, H3.0.10, H3.0.11, H3.0.12 and

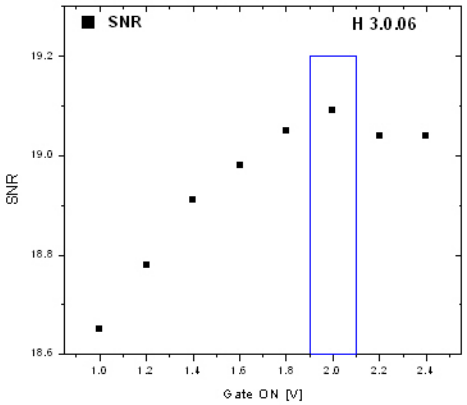
H3.0.16 for Telescope

whereas other modules have been discarded.

COCG A	standard design		1.5m deep p overlap
COCG B	standard design		1.2m deep p overlap;
COCG C	rad harder design	-	1.5m deep p overlap;
COCG E	rad harder design	-	1.2m deep p overlap;
COCG F	red. Poly stitch	-	1.5m deep p overlap;
COCG G	red. Poly stitch	-	1.2m deep p overlap;
C3G	cap. coupled clear (only)	-	1.2m deep p overlap.
L	large		(32x24um^2),
S	small		(24x24um^2)
VS	very small		(20x20um^2)

Results: Telescope modules



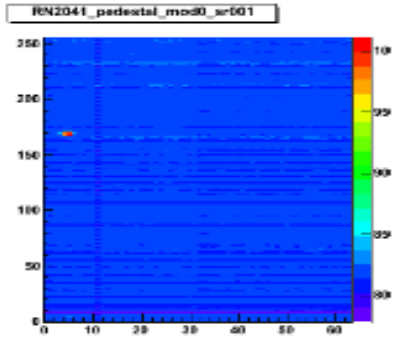


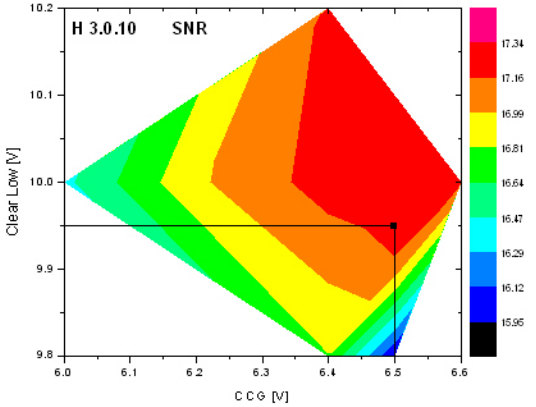
Hybrid ID: H3.0.06

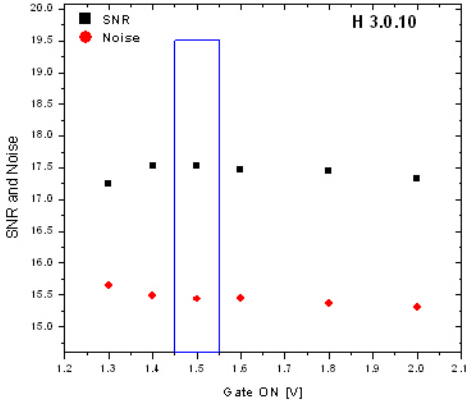
CCG= 6.4V CLow=10.0V GateON=2.0V

SNR= 19.1

Hot spot!







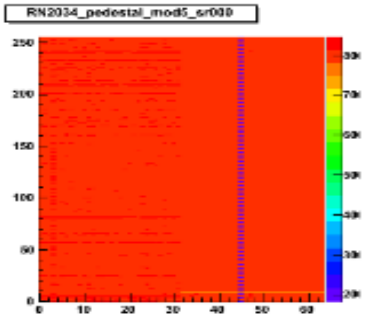
Hybrid ID: H3.0.10

CCG=6.5V CLow=9.95V GateON=1.5V

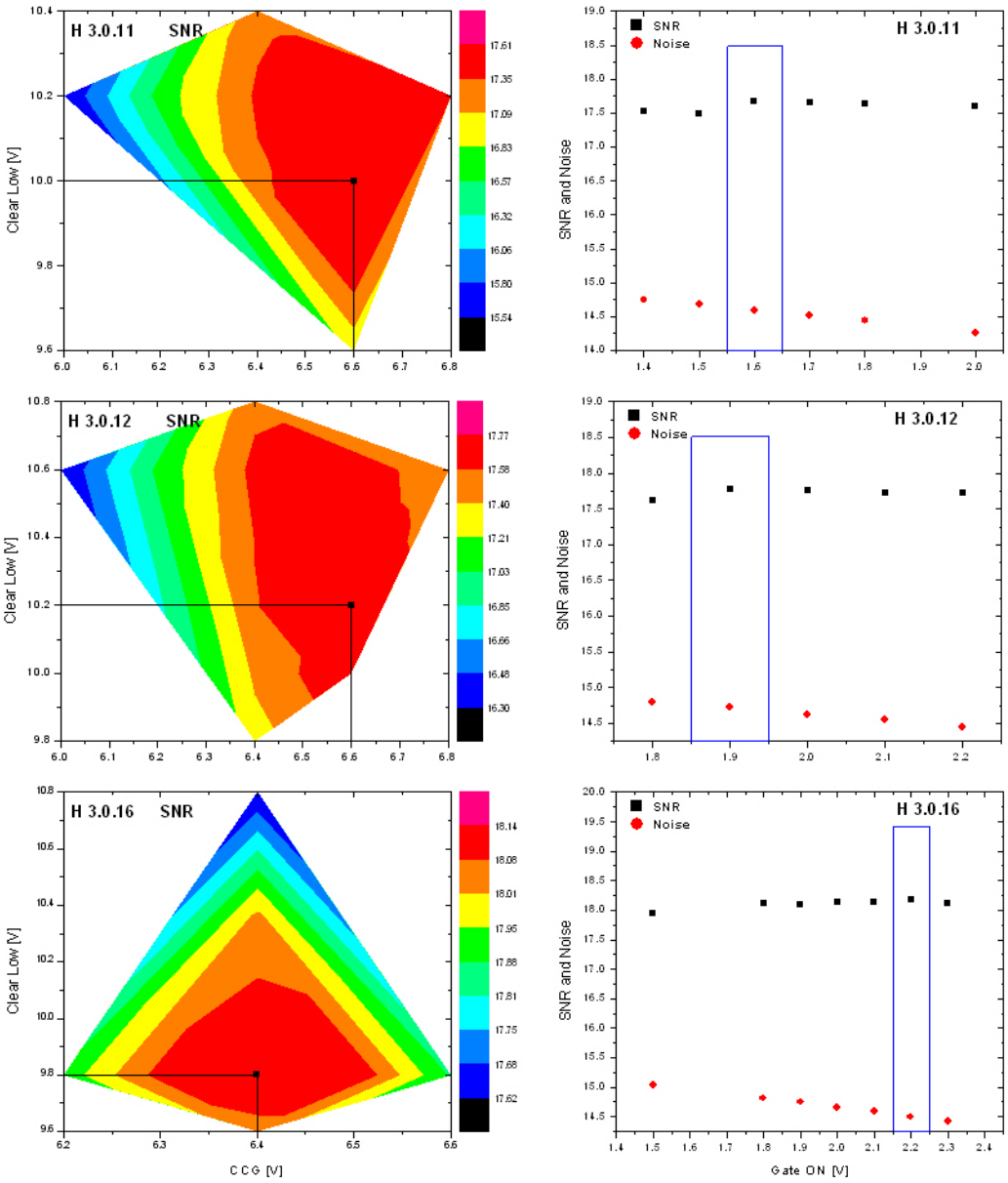
SNR=17.5

Noise=15.4 ADU

Dead column!



Results: Telescope modules



Hybrid ID: H3.0.11

CCG= 6.6V CLow=10.0V GateON= 1.6V

SNR= 17.7

Noise= 14.6 ADU

Hybrid ID: H3.0.12

CCG= 6.6V CLow= 10.2V GateON= 1.9V

SNR= 17.8

Noise= 14.7 ADU

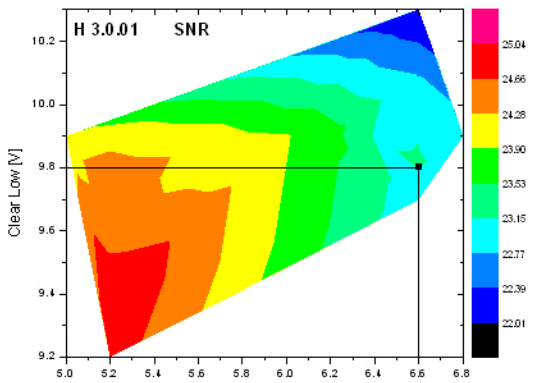
Hybrid ID: H3.0.16

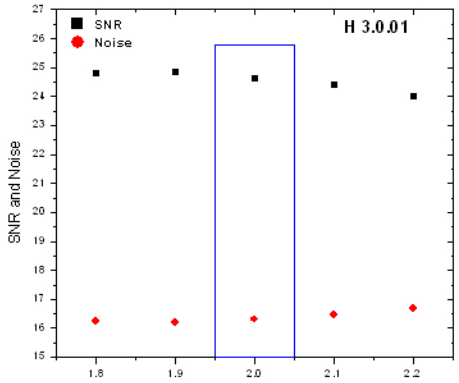
CCG= 6.4V CLow= 9.8V GateON= 2.2V

SNR= 18.2

Noise= 14.5 ADU

Results:DUTs





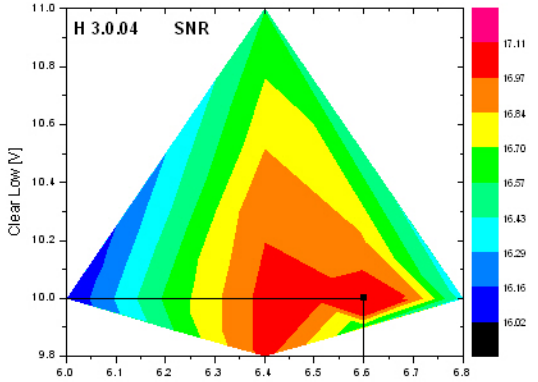
Hybrid ID: H3.0.01

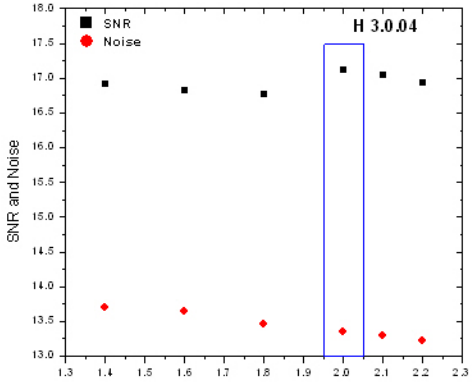
CCG=6.6V CLow=9.8V Gate ON=2.0V

SNR=23.2 C3G matrix

Noise= 16.5 ADU

6 dead rows



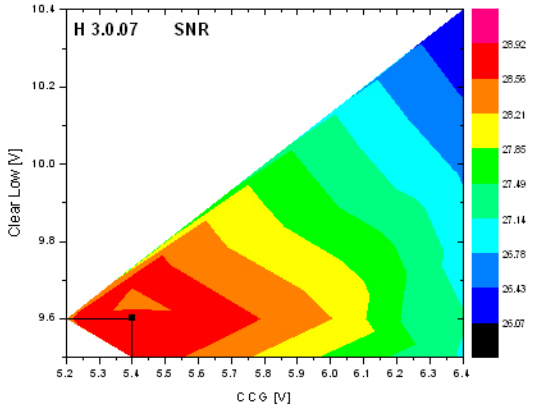


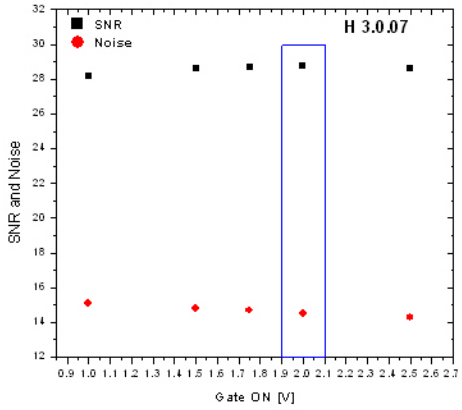
Hybrid ID: H3.0.04

CCG=6.6V CLow=10.0V Gate ON=2.0V

SNR=17.1

Noise=13.4 ADU





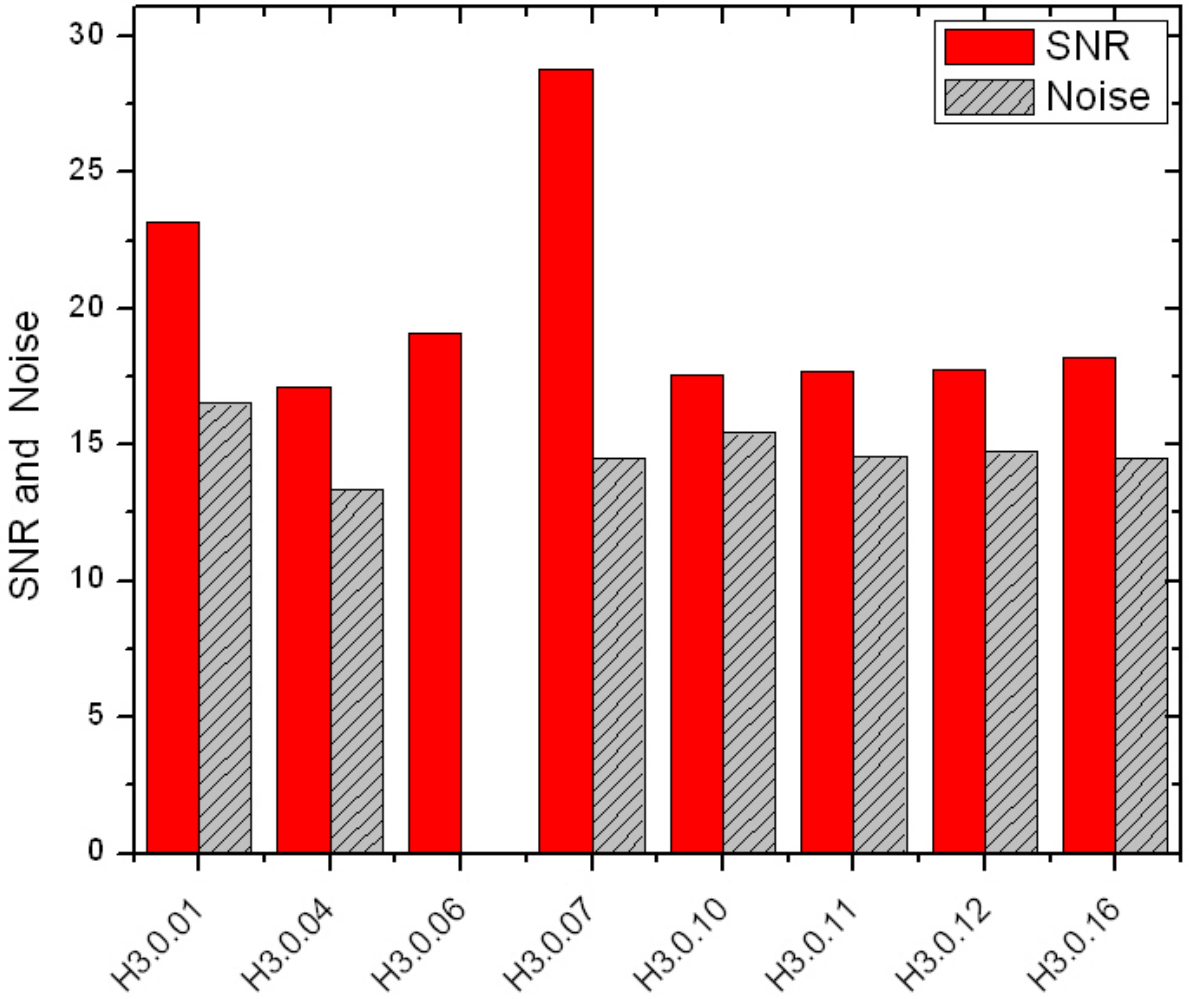
Hybrid ID: H3.0.07

CCG=5.6V CLow=9.6V GateON=2.0V

SNR=28.8 20x20μm^2

Noise=14.5 ADU

Results Summary



Acknowledgments

Characterization team:

Stefan Heindl,
Peter Kodys,
Christian Koffmane,
Carlos Mariñas,
Stefan Rummel,
Thomas Weiler

Remote help:
Bonn group