

Update on Unmaskable Channels

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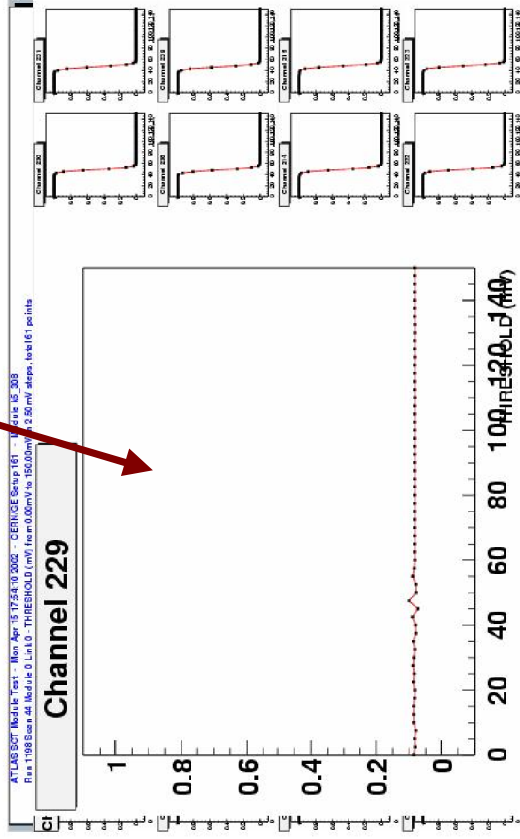
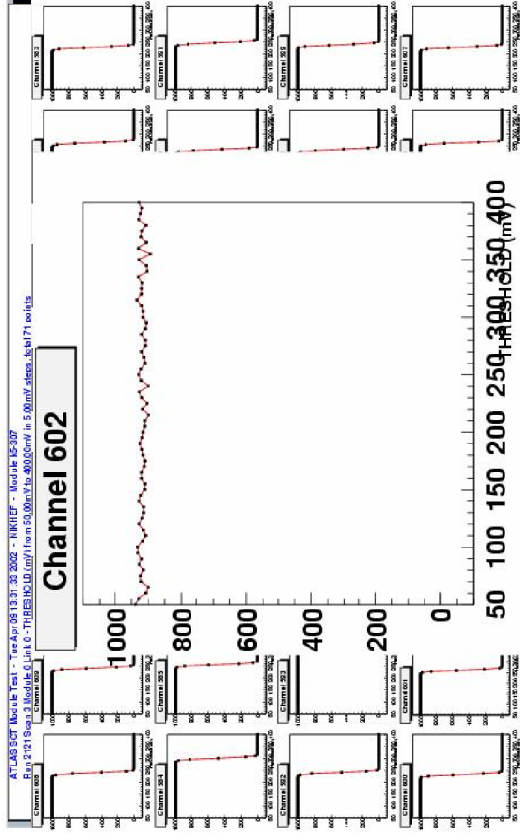


CERN/Geneva Team

News

Since the last report April 9th we/NIKHEF tested 5 more modules/hybrids:

- K5-304 (NIKHEF) ok
- K5-307 (NIKHEF) link0 ch602 90% (!)
- K5-305 (Geneva) ok
- K5-310h (Geneva) ok
- K5-308 (Geneva) link0 ch229 first 1e-3 then 8%
- K5-310 ?



Data courtesy S.Muijs, NIKHEF

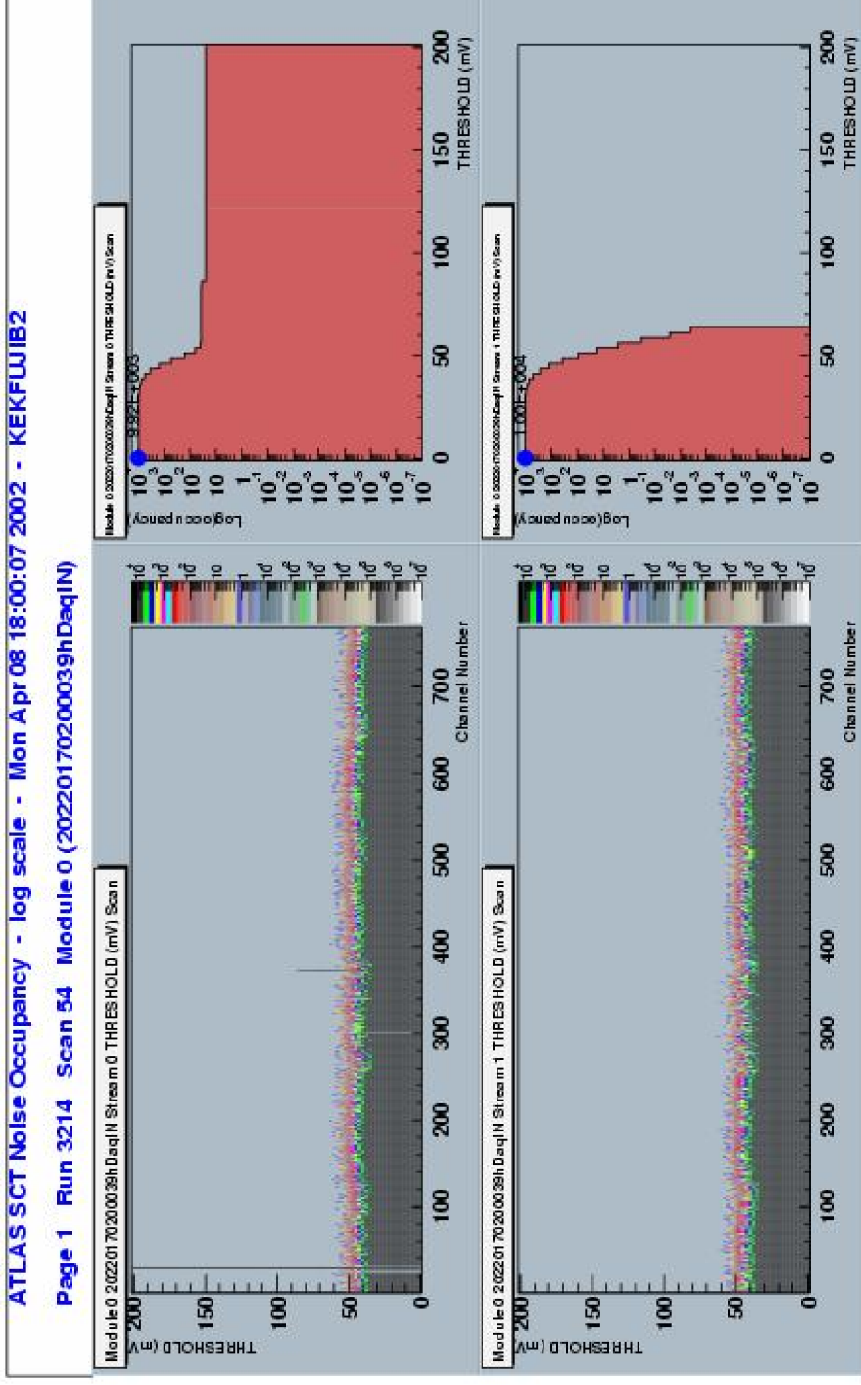
- One new type of unmaskable channel (90%)
- One more time dependence observed: ok before hybrid burn-in 1E-3 after hybrid burn-in (C.Ketterer) 8% on module ...
- Infant Mortality ? → ON/OFF hybrid tests

The Forward ASIC Puzzle

- All the chips with non-maskable channels were flagged 'ok' by wafer testers (to be confirmed concerning K5-307,308)
→ uncovered some issues (software compatibility) but no reason to 'distrust' their findings
- No pattern in site parameters (edge etc.) seen
- Pre-Production chips not really more vulnerable to this effect (W.Dabrowski)
- Barrel Community has 50 new hybrids but only observe one (3?) incident(s) of unmaskable channels (Nobu) → B39h L0 ch29,39 stuck @100%
- One Module in the Barrel System Test has an unmaskable channel similar to K5-308h after burn-in → B0011 link 1 ch 95
Infant Mortality ? → ON/OFF tests will help to provoke failure (Wladek)
Can we/may we 'break' B0011 ?
- B0011 channel was NOT caught by SCTDAQ Pipeline Test
→ How much can we rely on the Barrel Community's number ?

Barrelhybrid B39

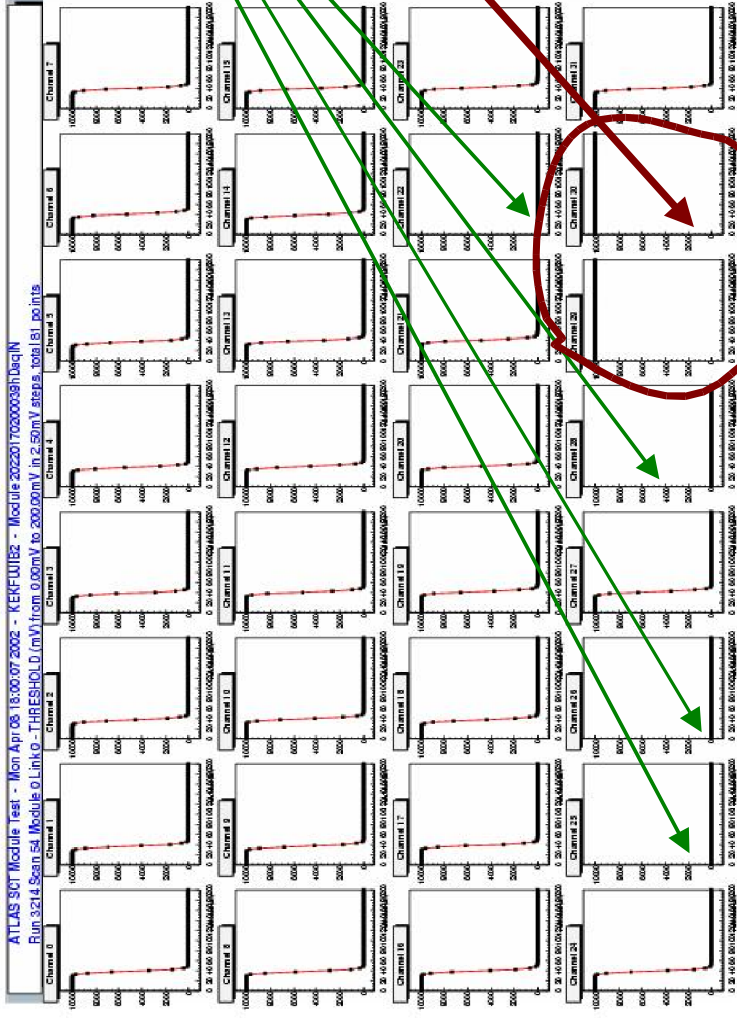
NoiseOccupancy



Data courtesy Nobu Unno

Barrelhybrid B39

Hybrid:

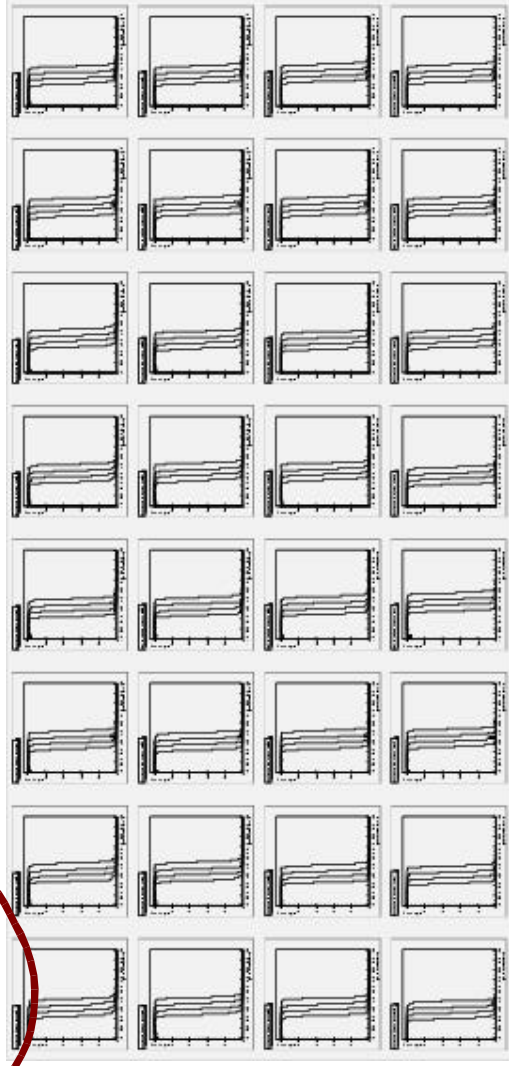


22,25,26,28,32
masked 'noisy'

29,30 masked
, untrimmable'

=> similar to kb-103

Data courtesy Nobu Unno



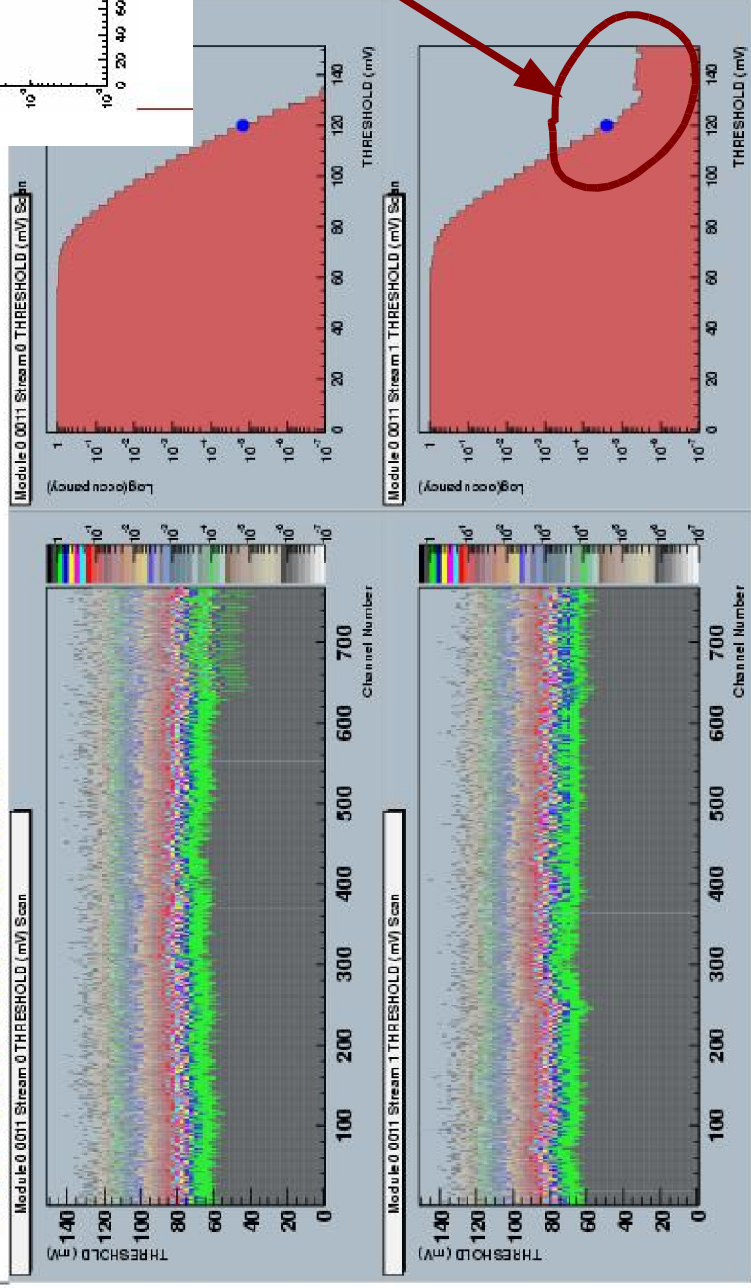
WaferTest S-Curves:

... no problem seen...

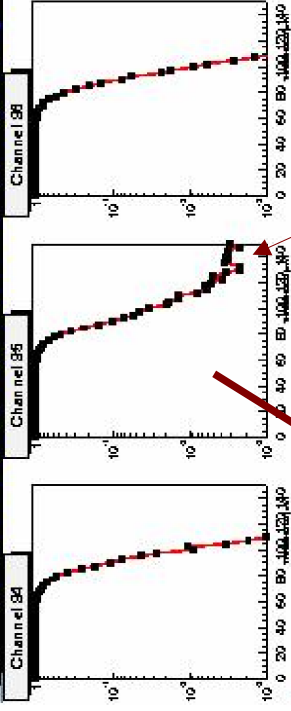
B0011

ATLAS SCT Noise Occupancy - log scale - Sat Jul 07 15:55:19 2001 - B186 Barrel System Test

Page 1 Run 653 Scan 1 Module 0 (0011)



ATLAS SCT Module Test - Sat Jul 07 15:55:19 2001 - B186 Barrel System Test
Run 10653 Scan 1 Module 0 Link 1 - THRESHOLD (mV) In



$\sim 1e-3$

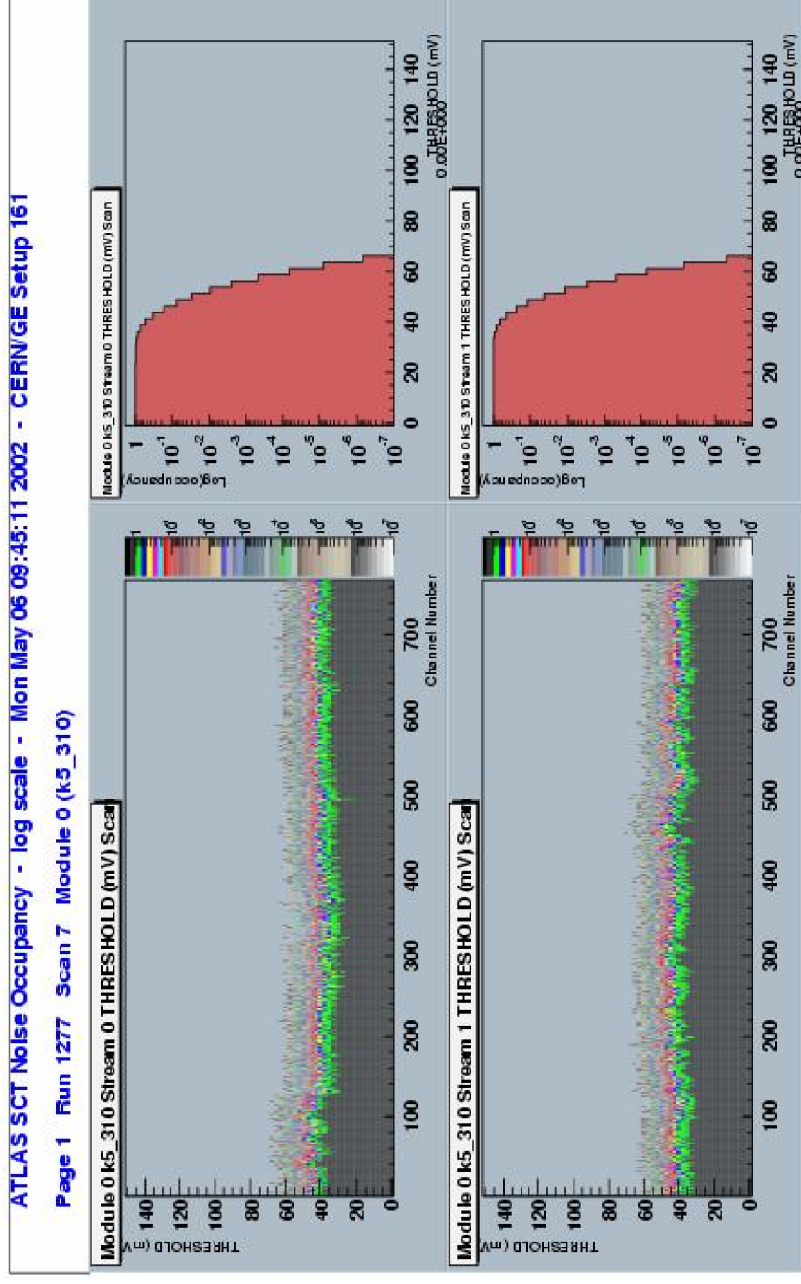
Data courtesy Joern Grosse-Knetter

No similarity to K5-308 (yet) established.

The ON/OFF Test

- 1000 power cycles
- every 20 power cycles do pipeline test
- Performed on KB-103 and K5-310

K5-310



Nothing yet
observed ...

ToDo List:

- Can we establish time dependence 0 → $1e-3$ → 8% ?
 - ON/OFF tests @ different temperatures might provoke failure
 - torture B0011 if we may ...
- Are time dependent effects really caught in the Barrel Hybrid Tests ?
 - we have asked for access to their data ...
- Production Quality Chips in the Future just to rule out a possible source of problems
- Bookkeeping ...