

# **SCT Barrel Modules**

**6 demonstrator modules**

**k3103**

**k3104**

**k3111**

**k3112**

**rlk6/k3108**

**scand1/k3107**

# **k3103 module**

**Sensors:** Hamamatsu ATLAS98

285  $\mu\text{m}$  thickness

<111> wafer

**ASICs:** ABCD2T

Batch 30423 (2nd batch), Wafer 3

**ASIC attach:** Conductive epoxy

**Hybrid:** Cu/Polyimide/CC bridge version 3

AGND, DGND split, with wire-bonds connection

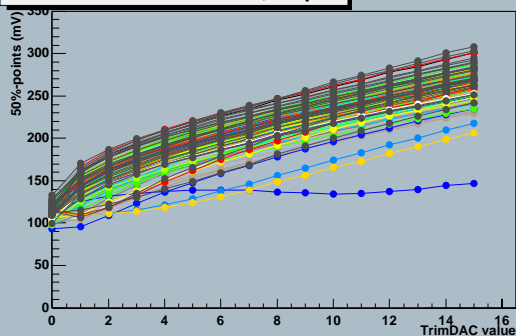
**CC bridge:** Cu/Au metalization



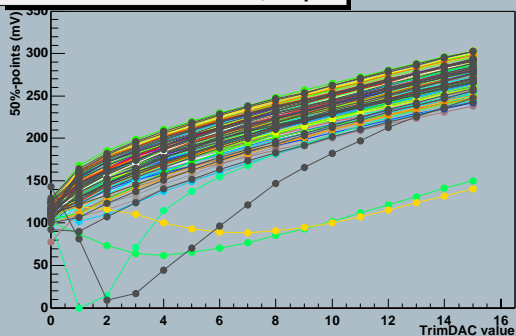
ATLAS SCT Module Test  
 ATLAS SCT Module Test  
 Run 236 Trim Scans Module 0 Link 0

Target value to be 200 mV  
 This gives 1504 trimmable channels

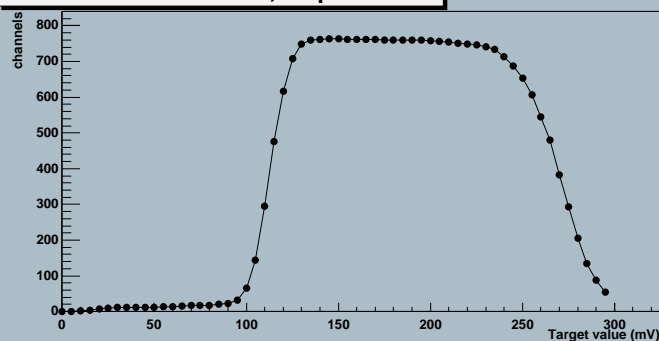
TrimDAC characteristics, chip 0



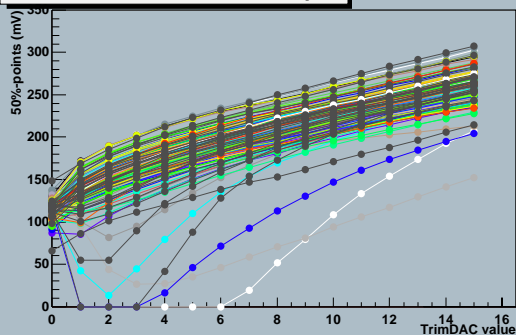
TrimDAC characteristics, chip 1



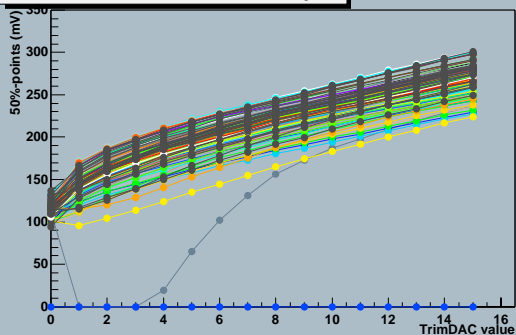
Trimmable channels, chip 0 to 5



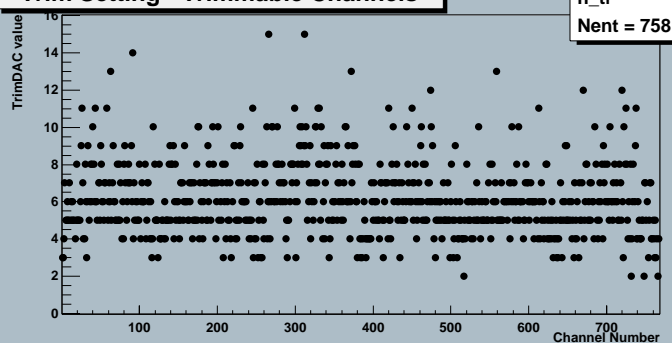
TrimDAC characteristics, chip 2



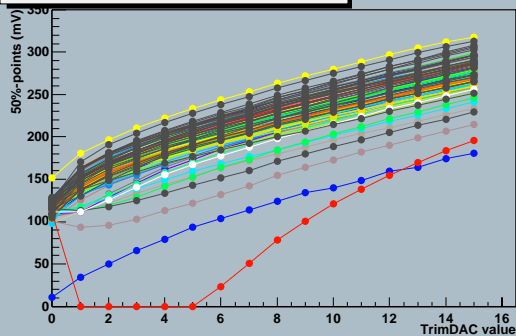
TrimDAC characteristics, chip 3



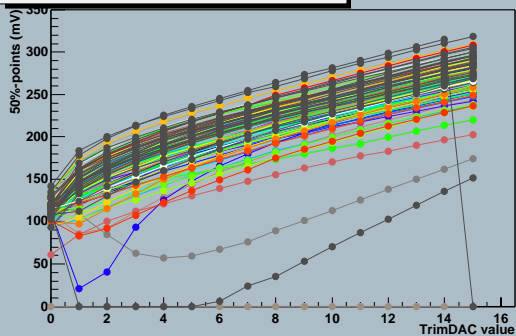
Trim Setting - Trimmable Channels



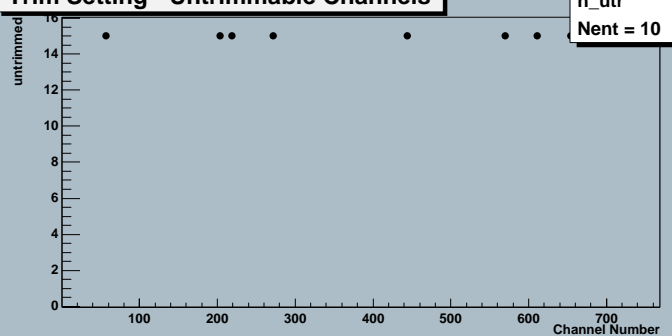
TrimDAC characteristics, chip 4



TrimDAC characteristics, chip 5



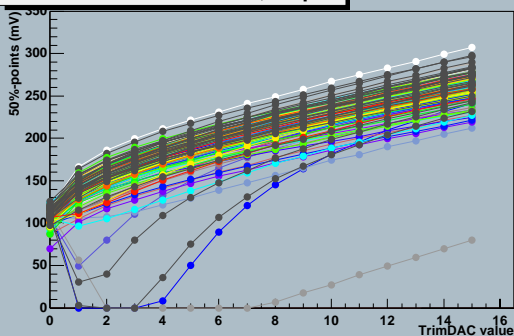
Trim Setting - Untrimmable Channels



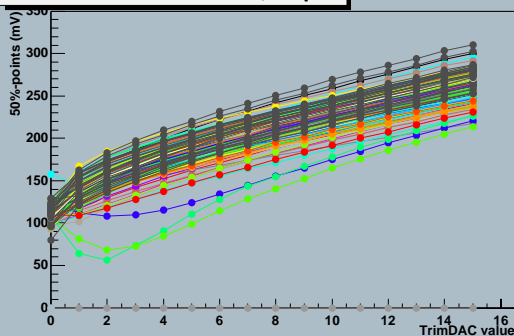
ATLAS SCT Module Test  
 ATLAS SCT Module Test  
 Run 236 Trim Scans Module 0 Link 1

Target value to be 200 mV  
 This gives 1504 trimmable channels

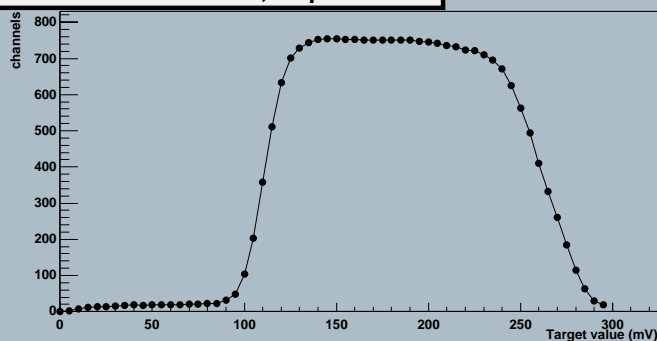
TrimDAC characteristics, chip 6



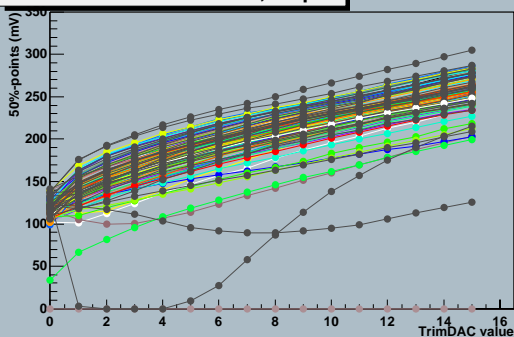
TrimDAC characteristics, chip 7



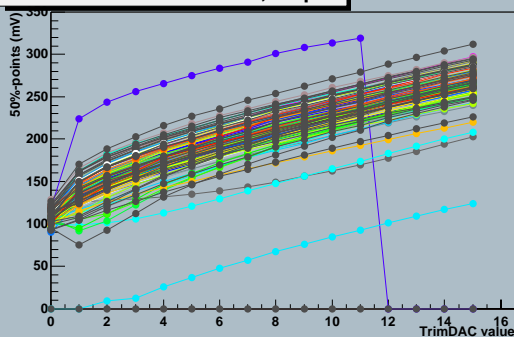
Trimmable channels, chip 6 to 11



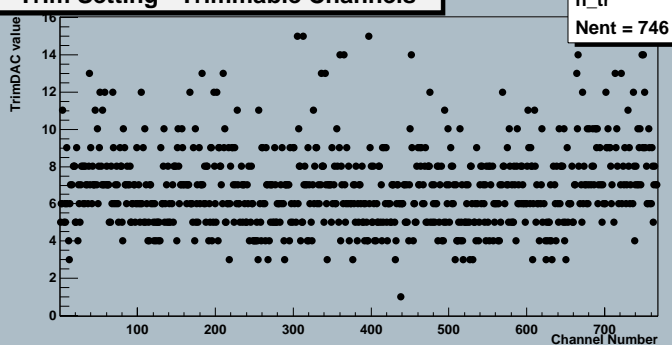
TrimDAC characteristics, chip 8



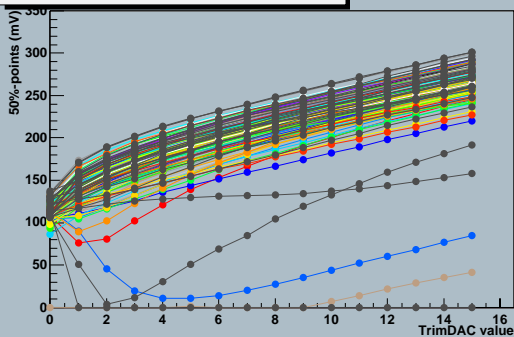
TrimDAC characteristics, chip 9



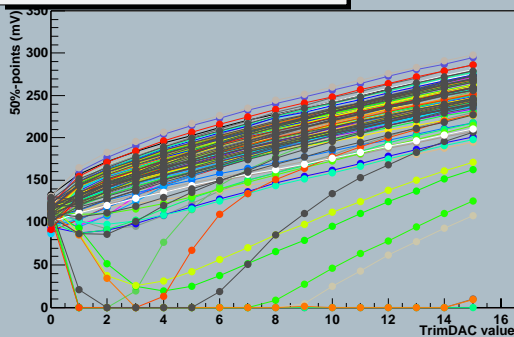
Trim Setting - Trimmable Channels



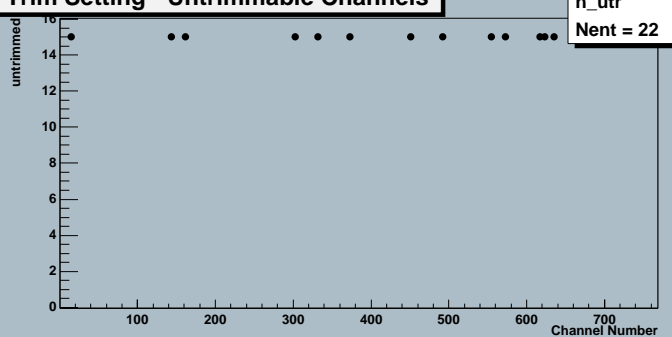
TrimDAC characteristics, chip 10



TrimDAC characteristics, chip 11



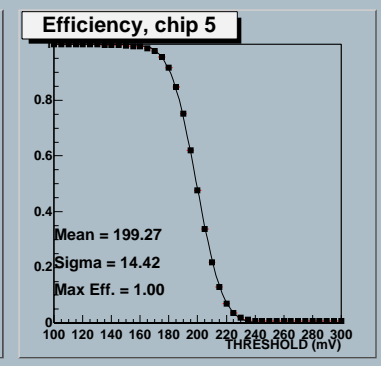
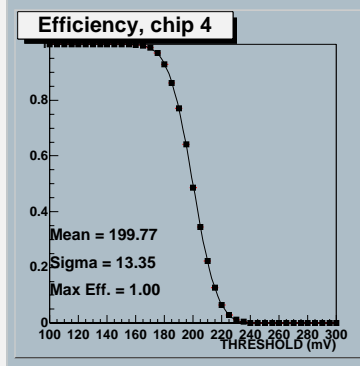
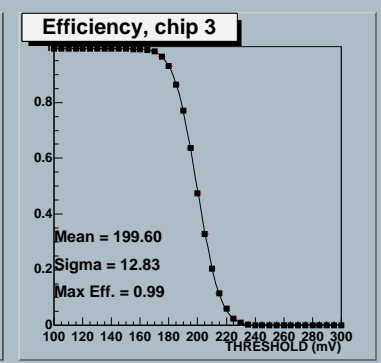
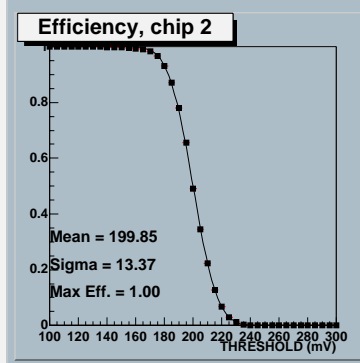
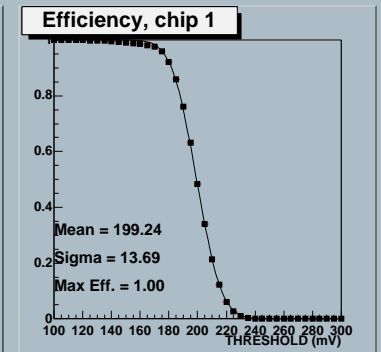
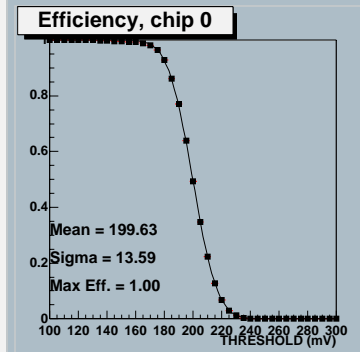
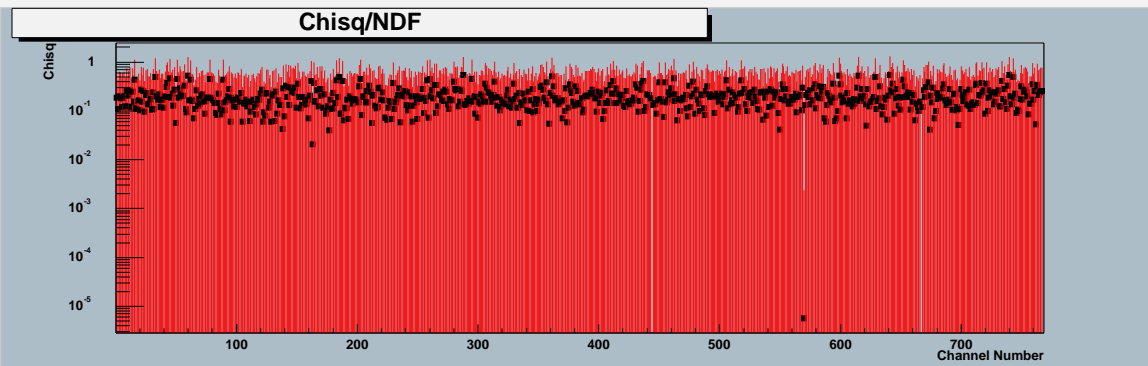
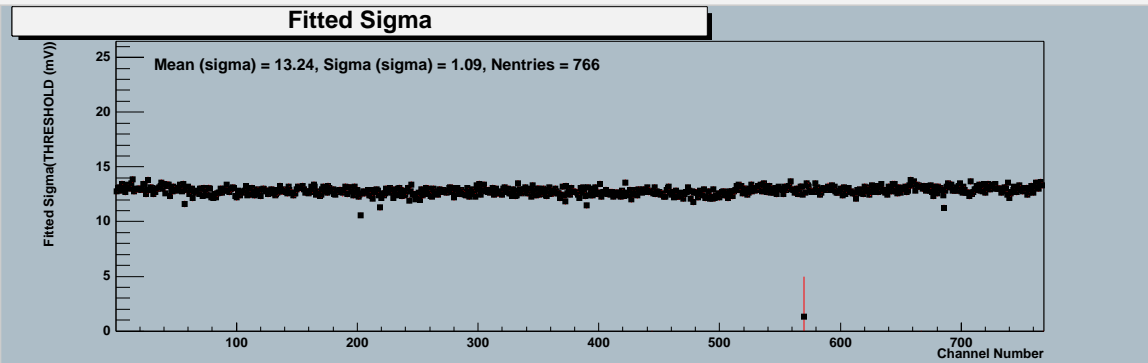
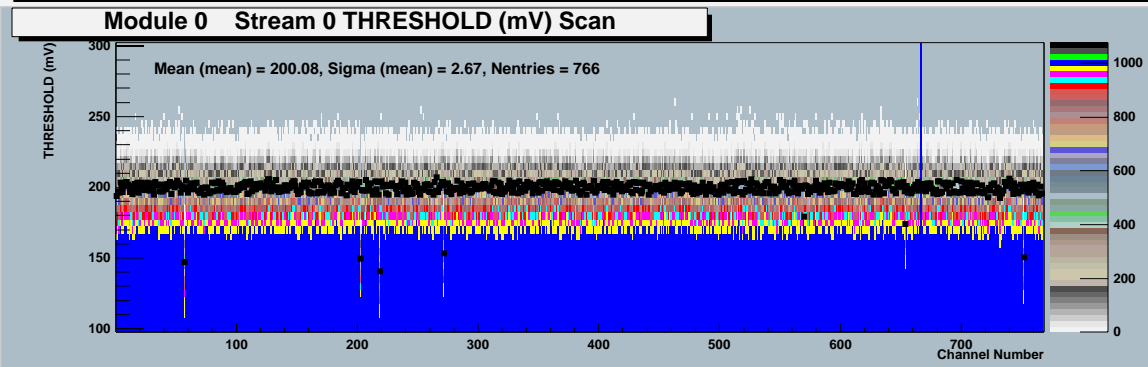
Trim Setting - Untrimmable Channels





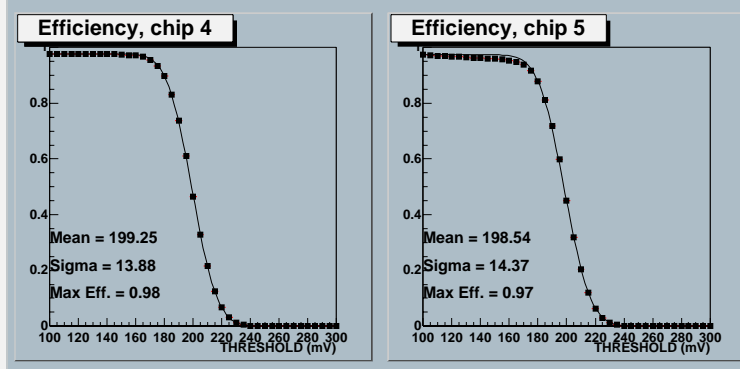
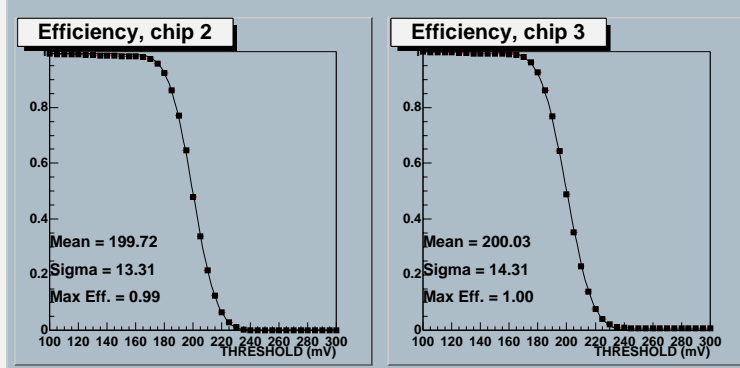
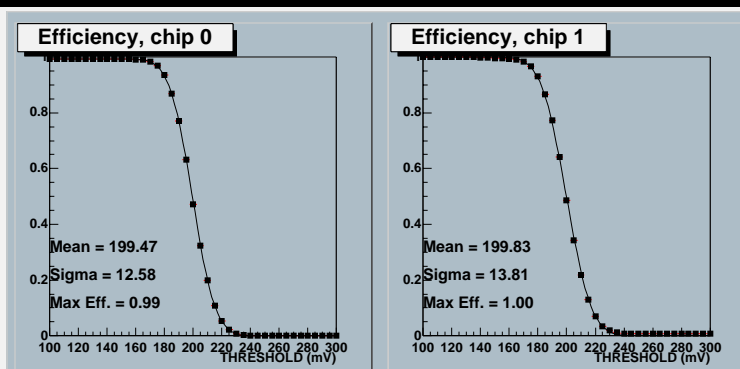
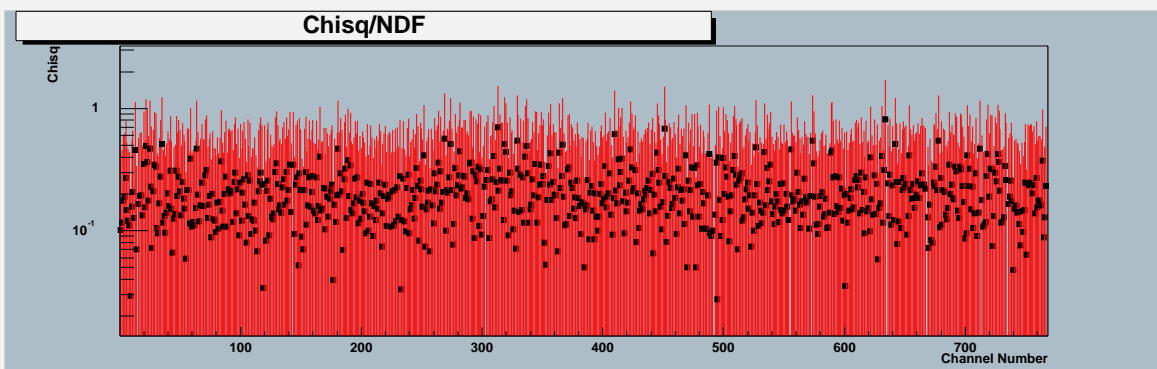
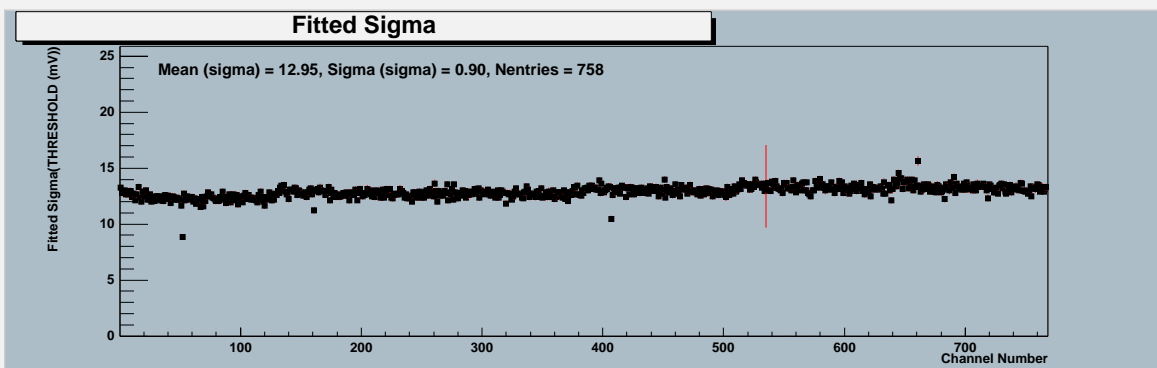
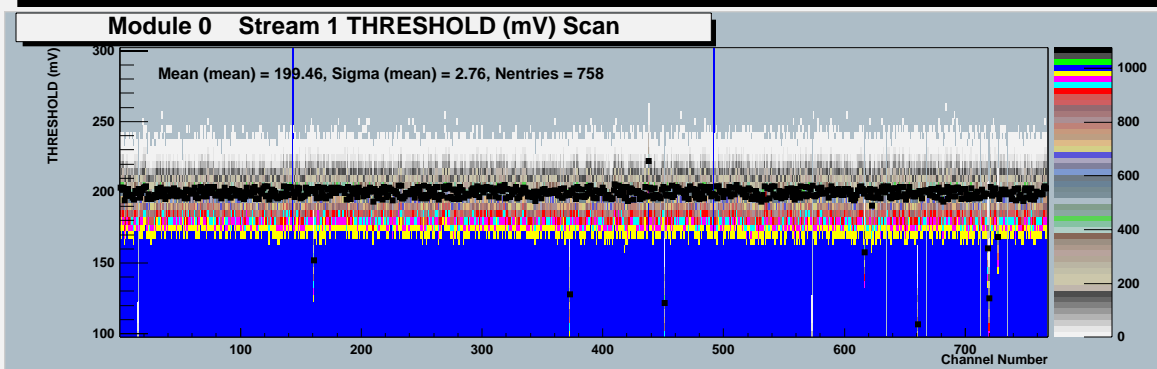
# ATLAS SCT Module Test

Run 238 Scan 4 Module 0 Stream 0 Scan type: THRESHOLD (mV)



# ATLAS SCT Module Test

Run 238 Scan 4 Module 0 Stream 1 Scan type: THRESHOLD (mV)

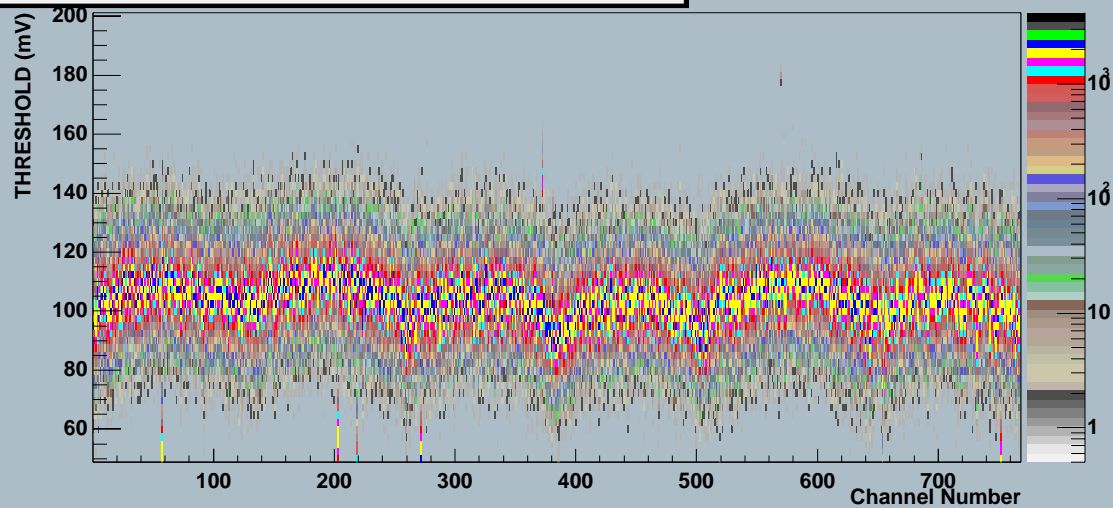


**ATLAS SCT Scan Comparison - log scale**

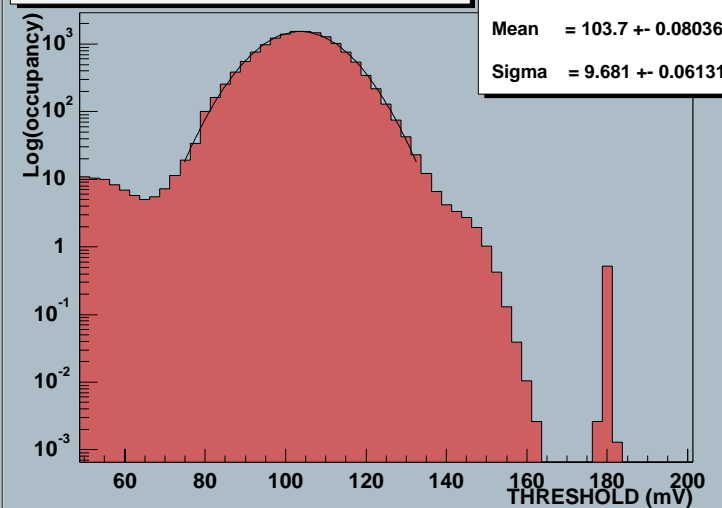
Run 242 Scan 2 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 242 Scan 2 Module 0 Stream 1 (Projection of ch 0 to ch 767)

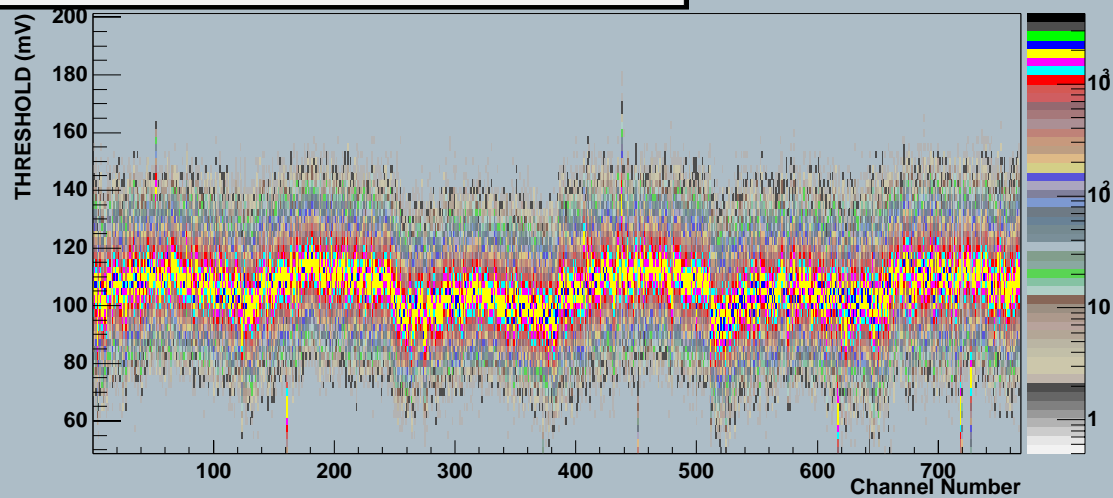
**Module 0 Stream 0 THRESHOLD (mV) Scan**



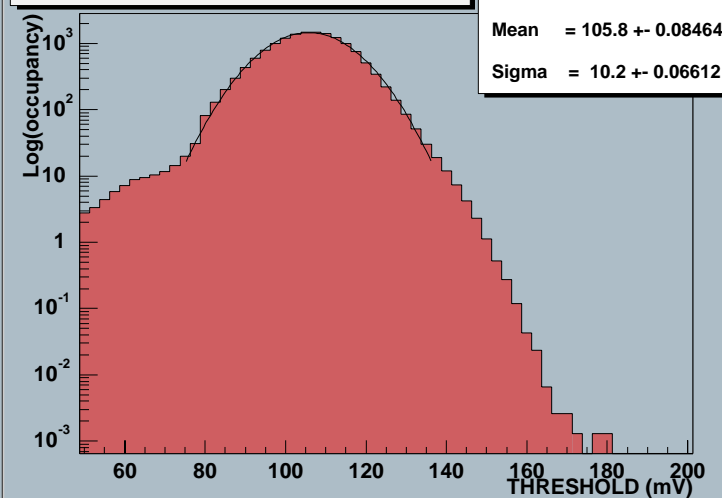
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



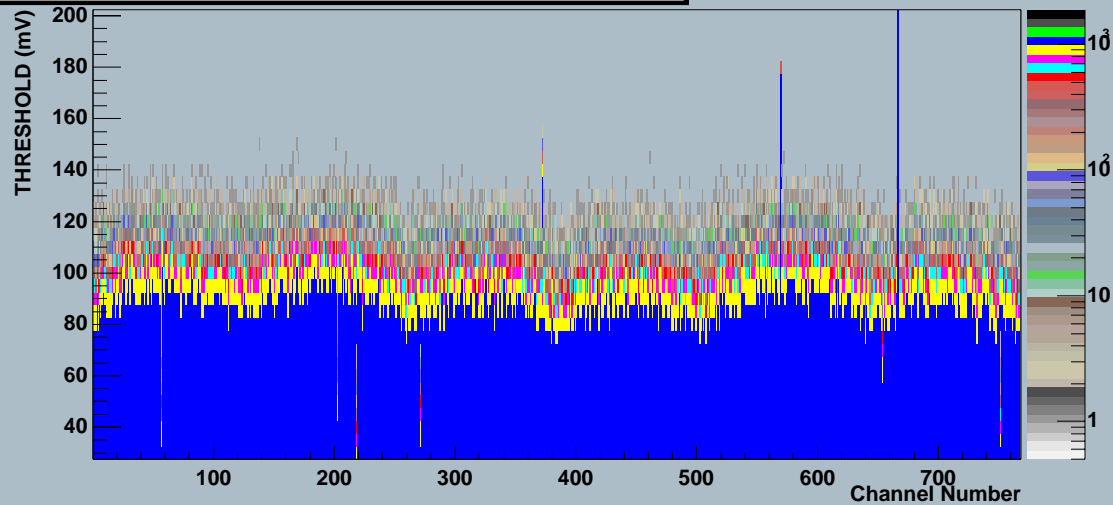


**ATLAS SCT Scan Comparison - log scale**

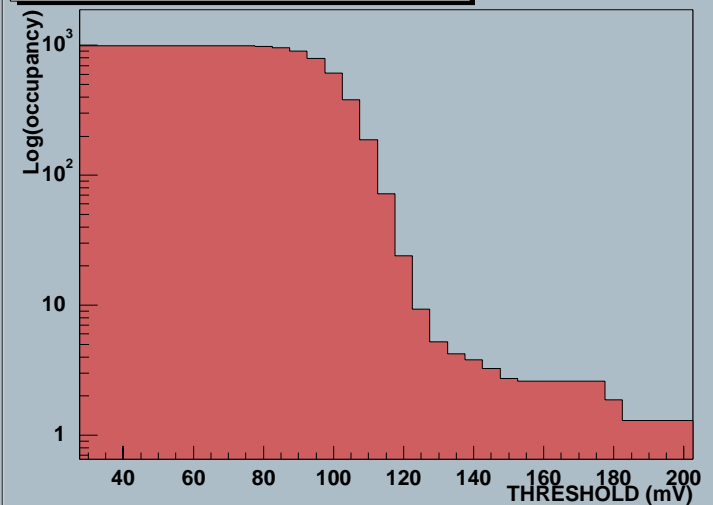
Run 238 Scan 1 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 238 Scan 1 Module 0 Stream 1 (Projection of ch 0 to ch 767)

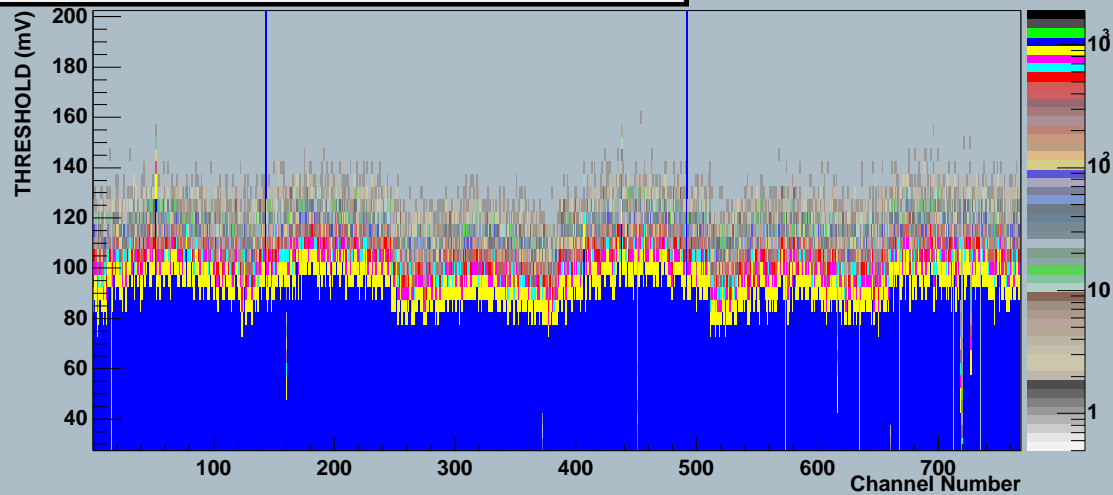
**Module 0 Stream 0 THRESHOLD (mV) Scan**



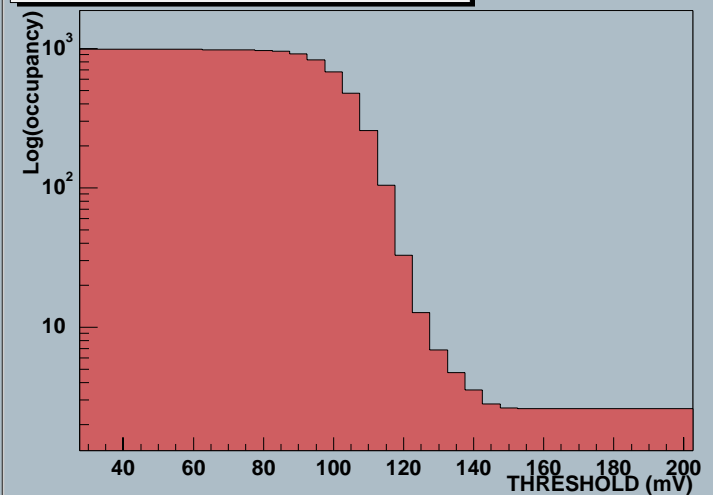
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



# **k3104 module**

**Sensors:** Hamamatsu ATLAS98  
285  $\mu\text{m}$  thickness  
<111> wafer

**ASICs:** ABCD2T  
Batch 30423 (2nd batch), Wafer 3

**ASIC attach:** Conductive epoxy

**Hybrid:** Cu/Polyimide/CC bridge version 3  
AGND, DGND split, with wire-bonds connection

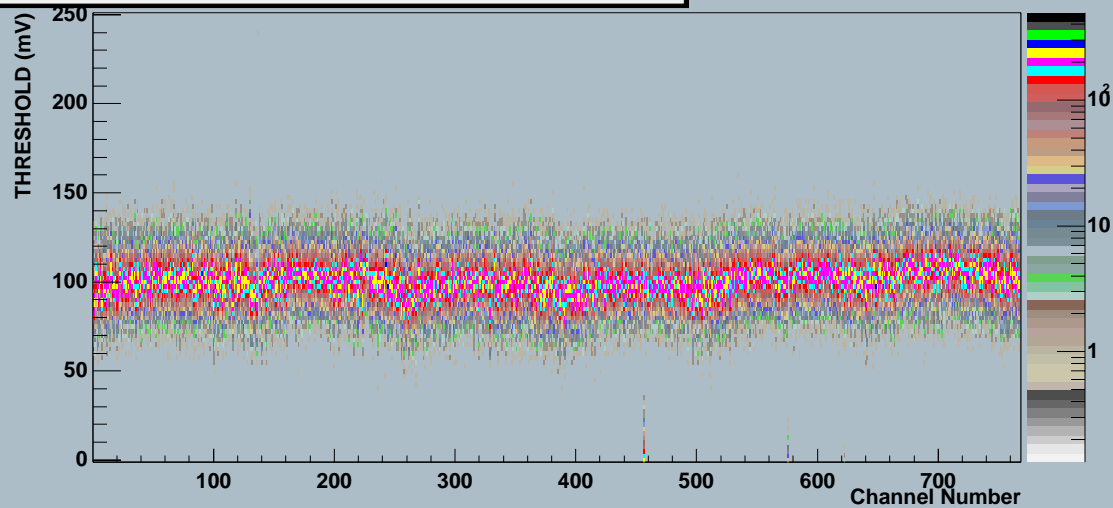
**CC bridge:** Cu/Au metalization

**ATLAS SCT Scan Comparison - log scale**

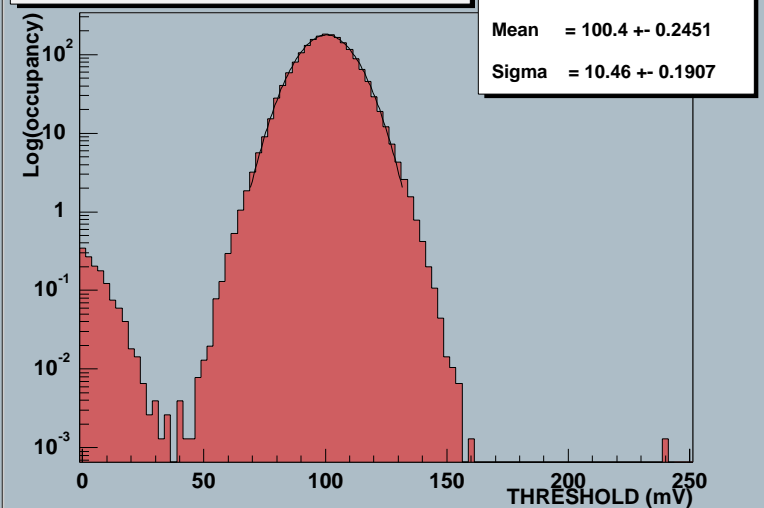
Run 1490 Scan 1 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1490 Scan 1 Module 0 Stream 1 (Projection of ch 0 to ch 767)

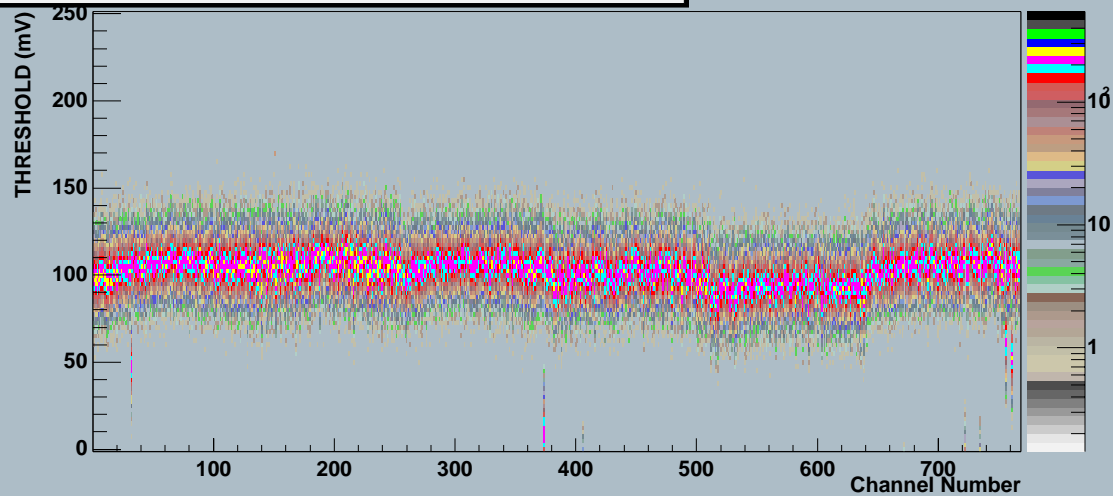
**Module 0 Stream 0 THRESHOLD (mV) Scan**



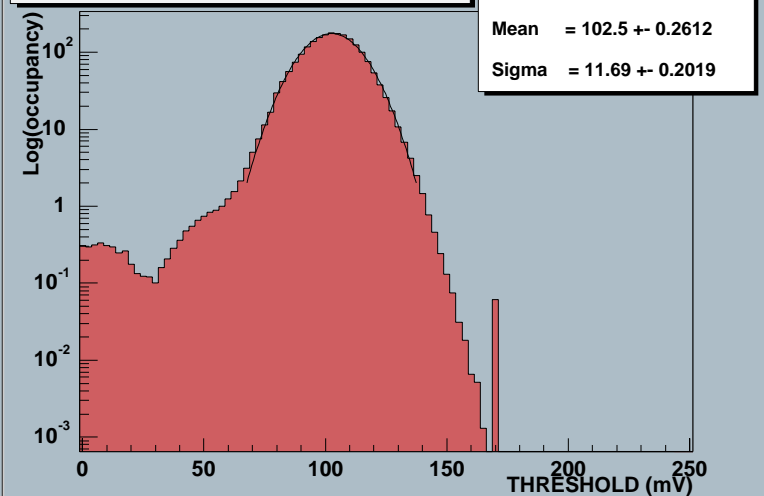
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**

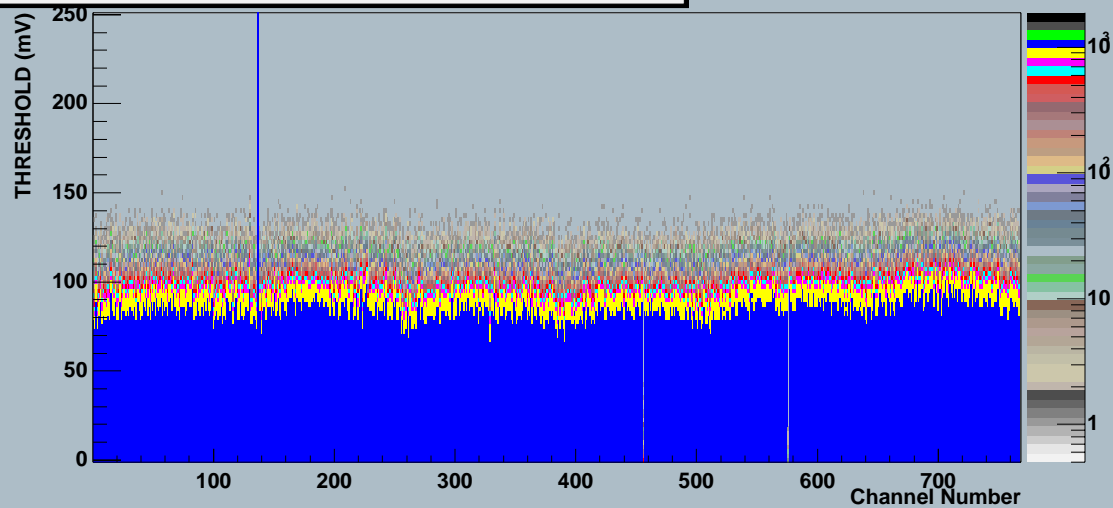


**ATLAS SCT Scan Comparison - log scale**

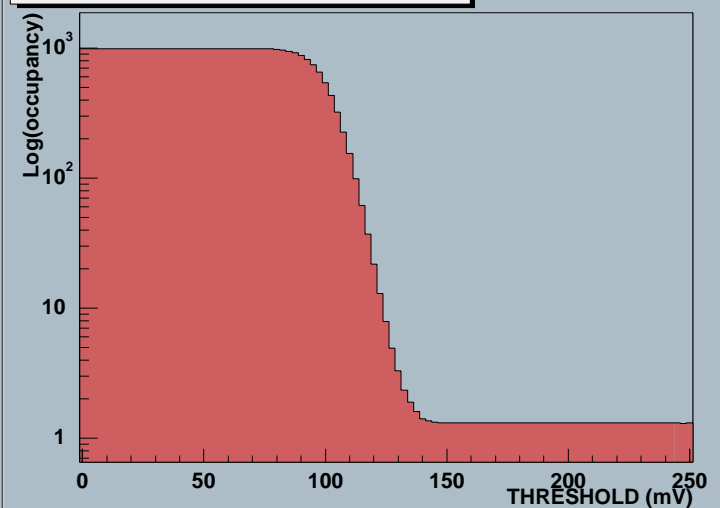
Run 1490 Scan 3 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1490 Scan 3 Module 0 Stream 1 (Projection of ch 0 to ch 767)

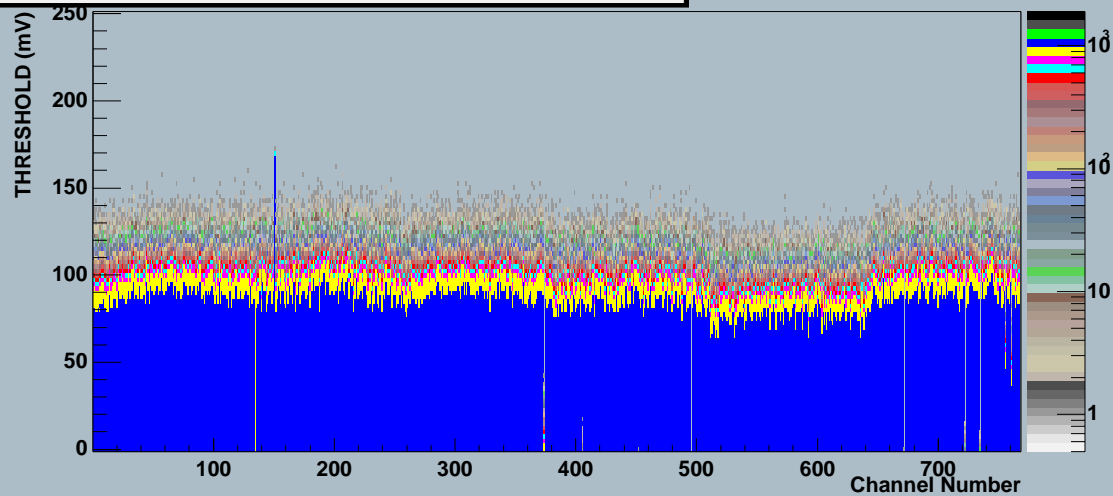
**Module 0 Stream 0 THRESHOLD (mV) Scan**



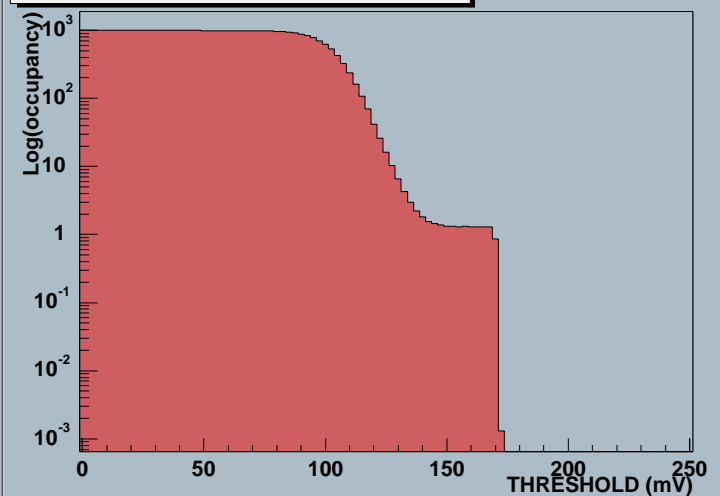
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



# **k3111 module**

**Sensors:** Hamamatsu ATLAS98  
285  $\mu\text{m}$  thickness  
<111> wafer

**ASICs:** ABCD2T  
Batch 29476 (1st batch), Wafer 15

**ASIC attach:** Conductive epoxy

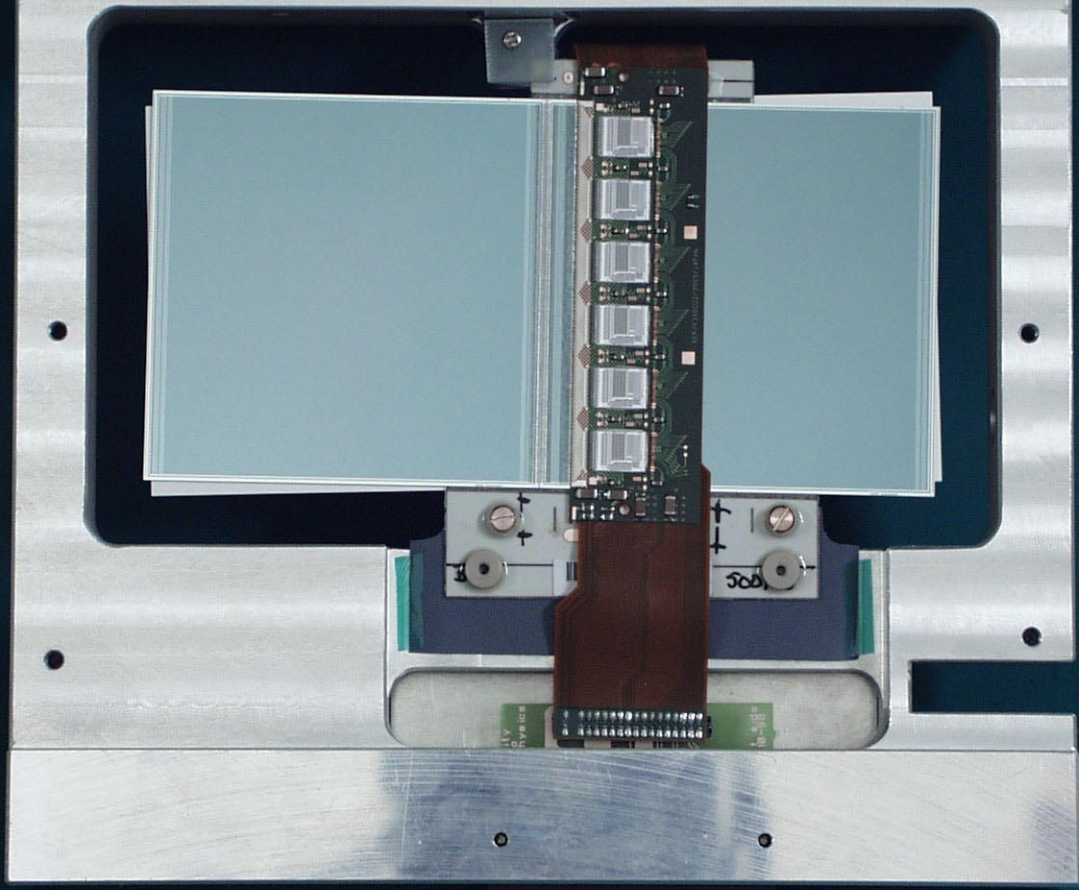
**Hybrid:** Cu/Polyimide/CC bridge version 3  
AGND, DGND split, with wire-bonds connection

**CC bridge:** Polymer-coating, with cut-outs for electrical and thermal conduction of chips

表

Atlas @ KEK

ABCD 2T



D7226 ▼

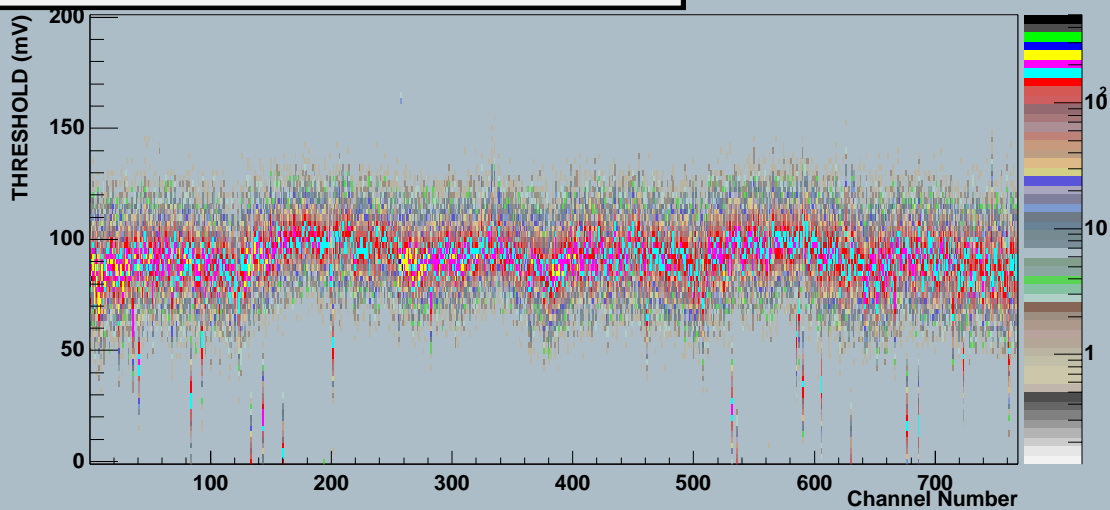


**ATLAS SCT Scan Comparison - log scale**

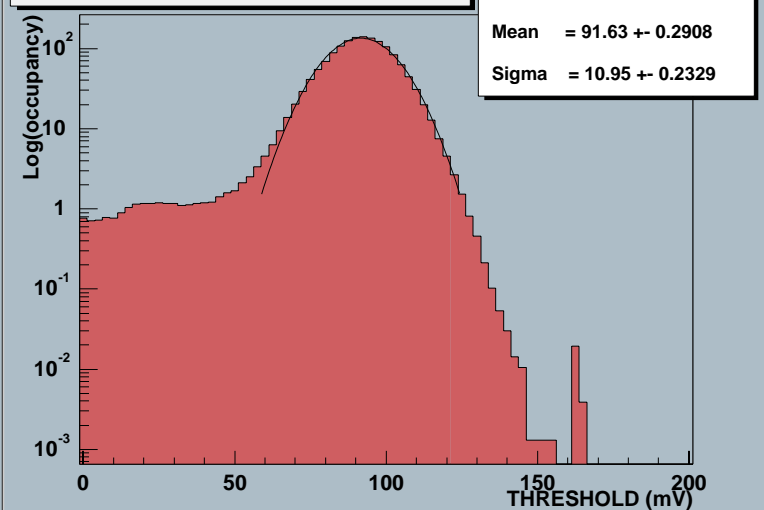
Run 1477 Scan 1 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1477 Scan 1 Module 0 Stream 1 (Projection of ch 0 to ch 767)

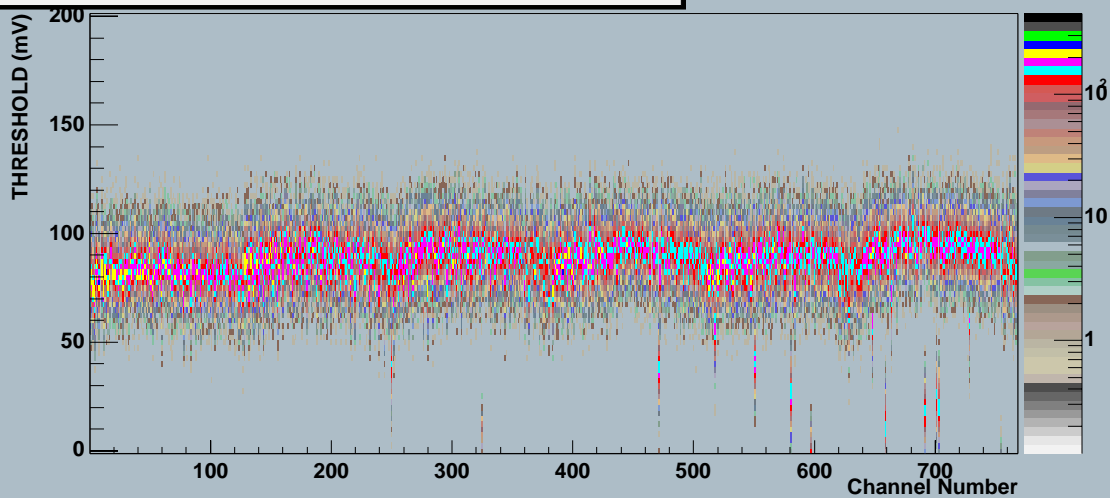
**Module 0 Stream 0 THRESHOLD (mV) Scan**



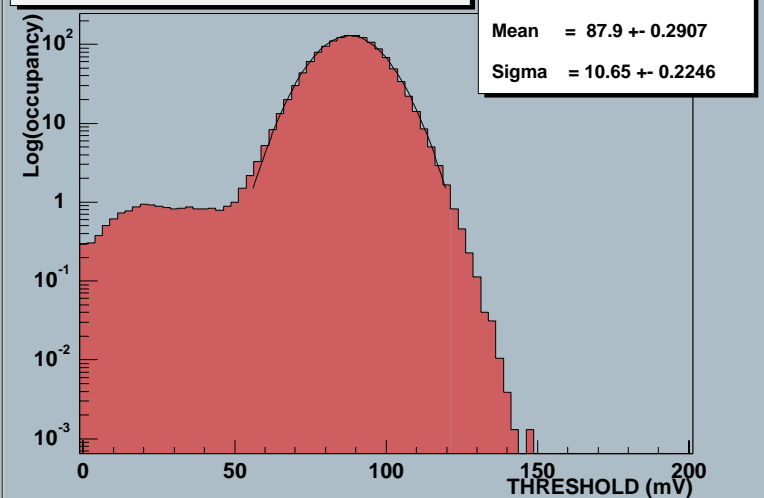
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**

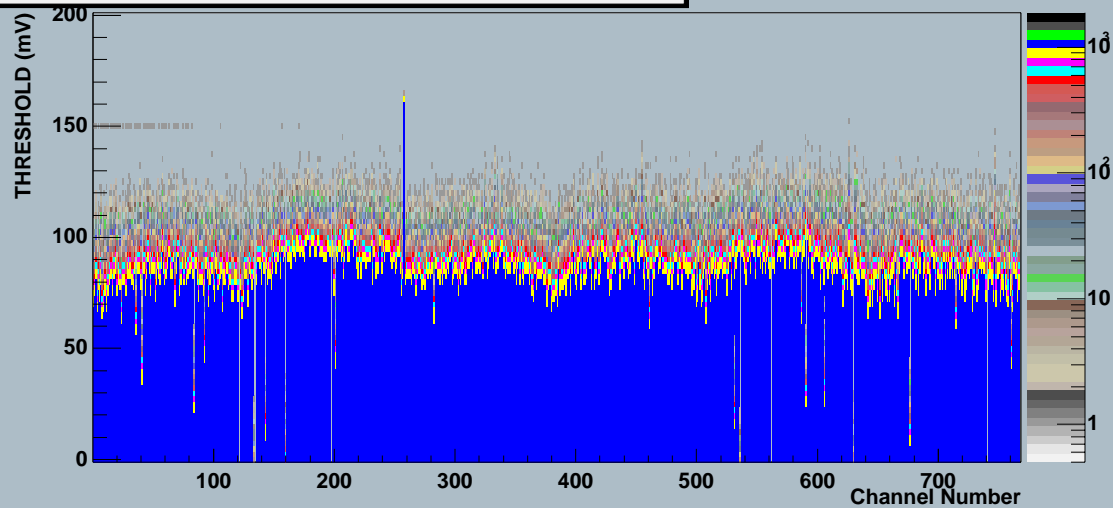


**ATLAS SCT Scan Comparison - log scale**

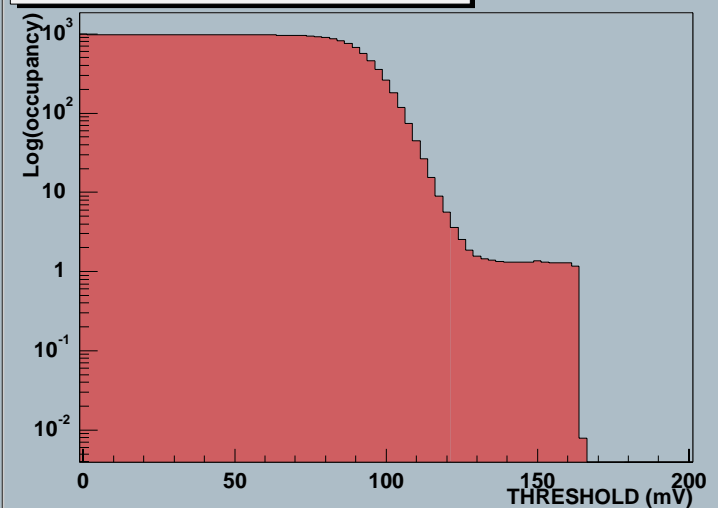
Run 1438 Scan 2 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1438 Scan 2 Module 0 Stream 1 (Projection of ch 0 to ch 767)

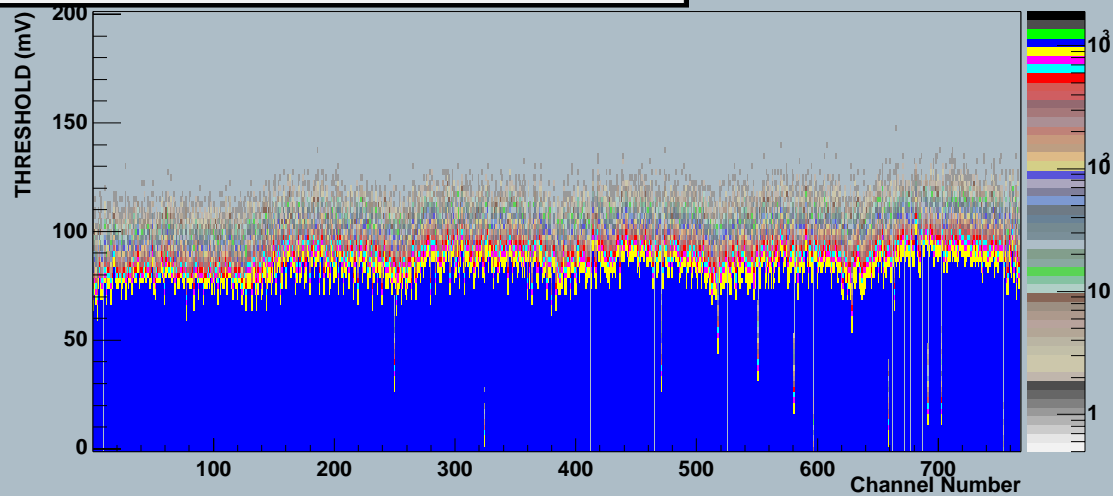
**Module 0 Stream 0 THRESHOLD (mV) Scan**



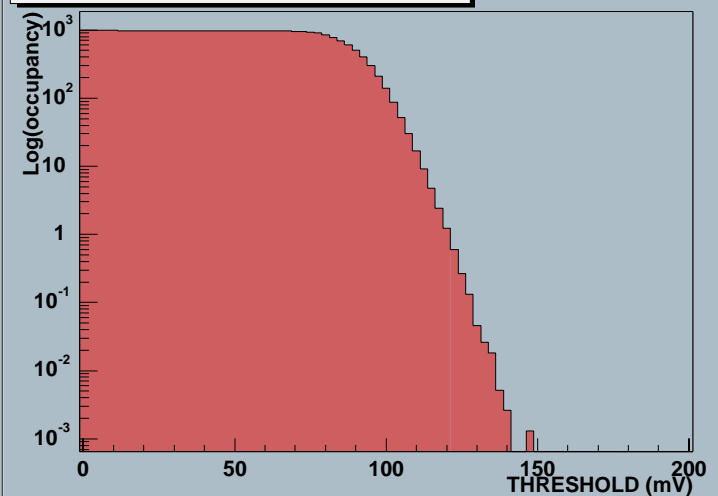
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



# **k3112 module**

**Sensors:** Hamamatsu ATLAS98  
287  $\mu\text{m}$  thickness  
<100> wafer

**ASICs:** ABCD2T  
Batch 29476 (1st batch), Wafer 15

**ASIC attach:** Conductive epoxy

**Hybrid:** Cu/Polyimide/CC bridge version 3  
AGND, DGND split, with wire-bonds connection

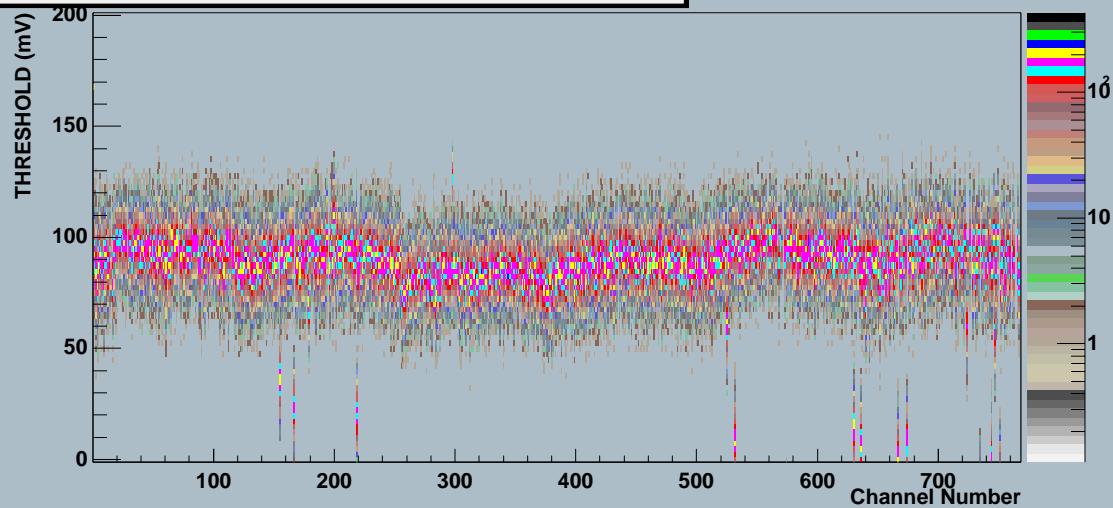
**CC bridge:** Polymer-coating, with cut-outs for electrical and thermal conduction of chips

**ATLAS SCT Scan Comparison - log scale**

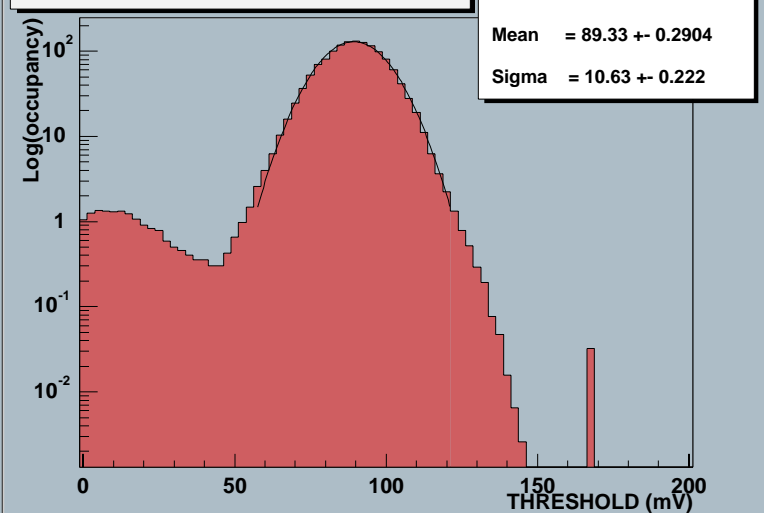
Run 1530 Scan 2 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1530 Scan 2 Module 0 Stream 1 (Projection of ch 0 to ch 767)

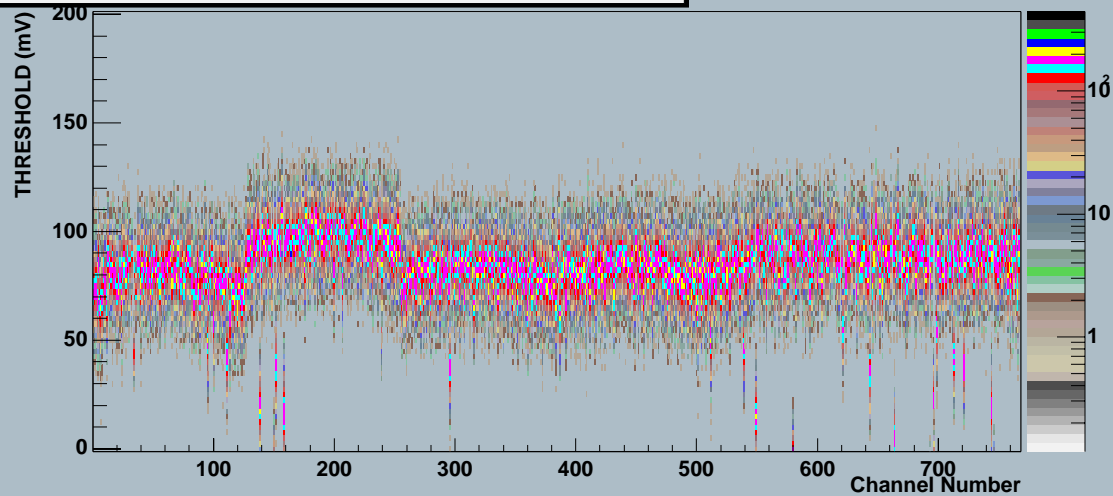
**Module 0 Stream 0 THRESHOLD (mV) Scan**



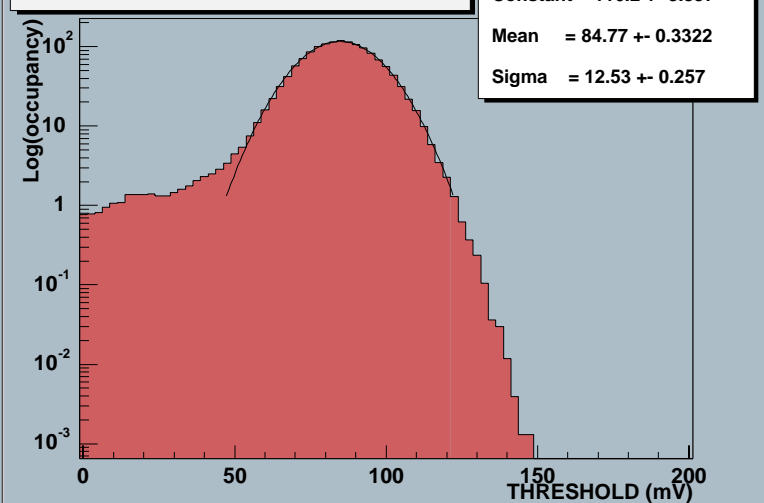
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**

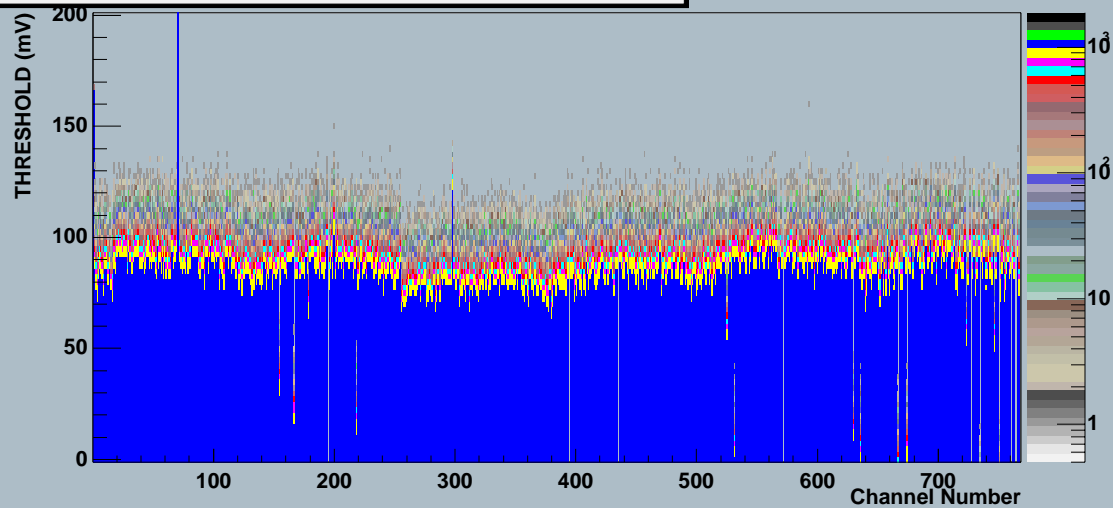


**ATLAS SCT Scan Comparison - log scale**

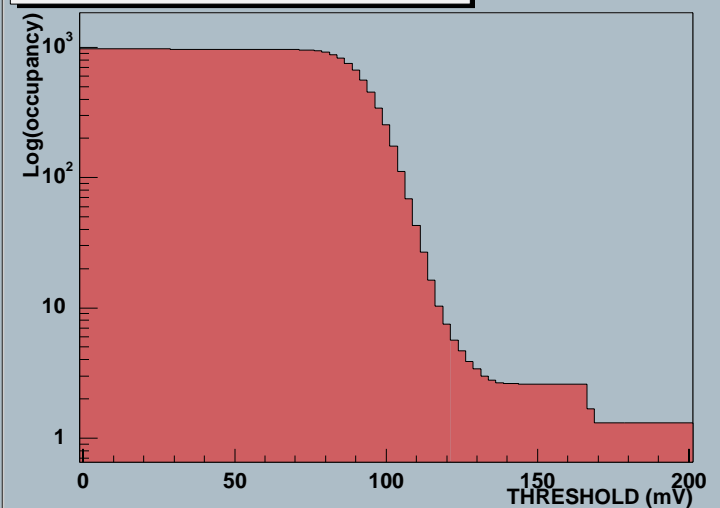
Run 1530 Scan 1 Module 0 Stream 0 (Projection of ch 0 to ch 767) vs

Run 1530 Scan 1 Module 0 Stream 1 (Projection of ch 0 to ch 767)

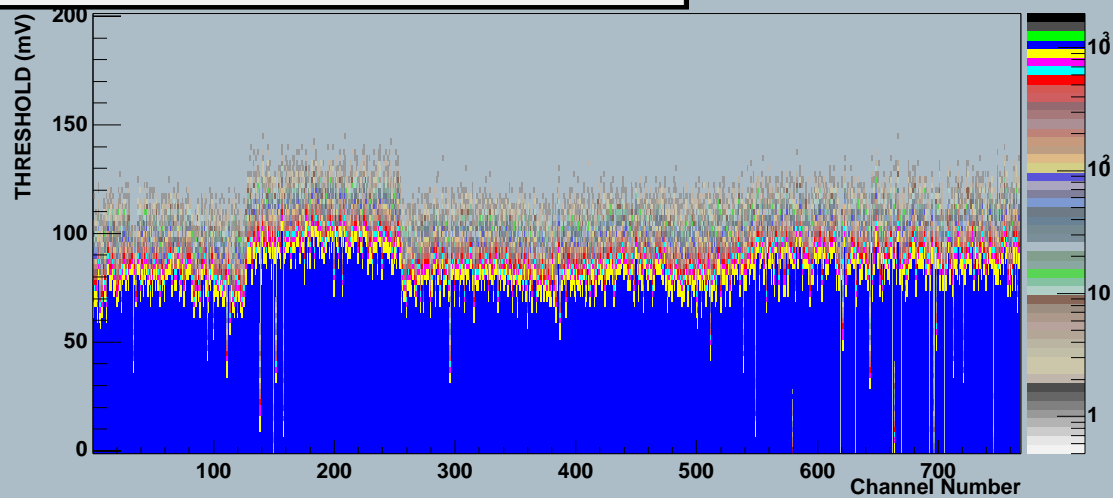
**Module 0 Stream 0 THRESHOLD (mV) Scan**



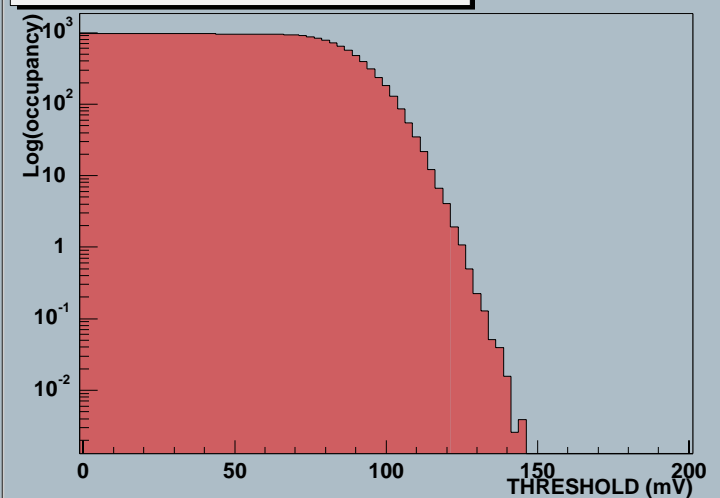
**Module 0 Stream 0 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



**Module 0 Stream 1 THRESHOLD (mV) Scan**



# **rlk6/k3108 module**

**Sensors:** Hamamatsu ATLAS98  
285  $\mu\text{m}$  thickness  
<111> wafer

**ASICs:** ABCD2T  
Batch 29476 (1st batch) , Wafer 16

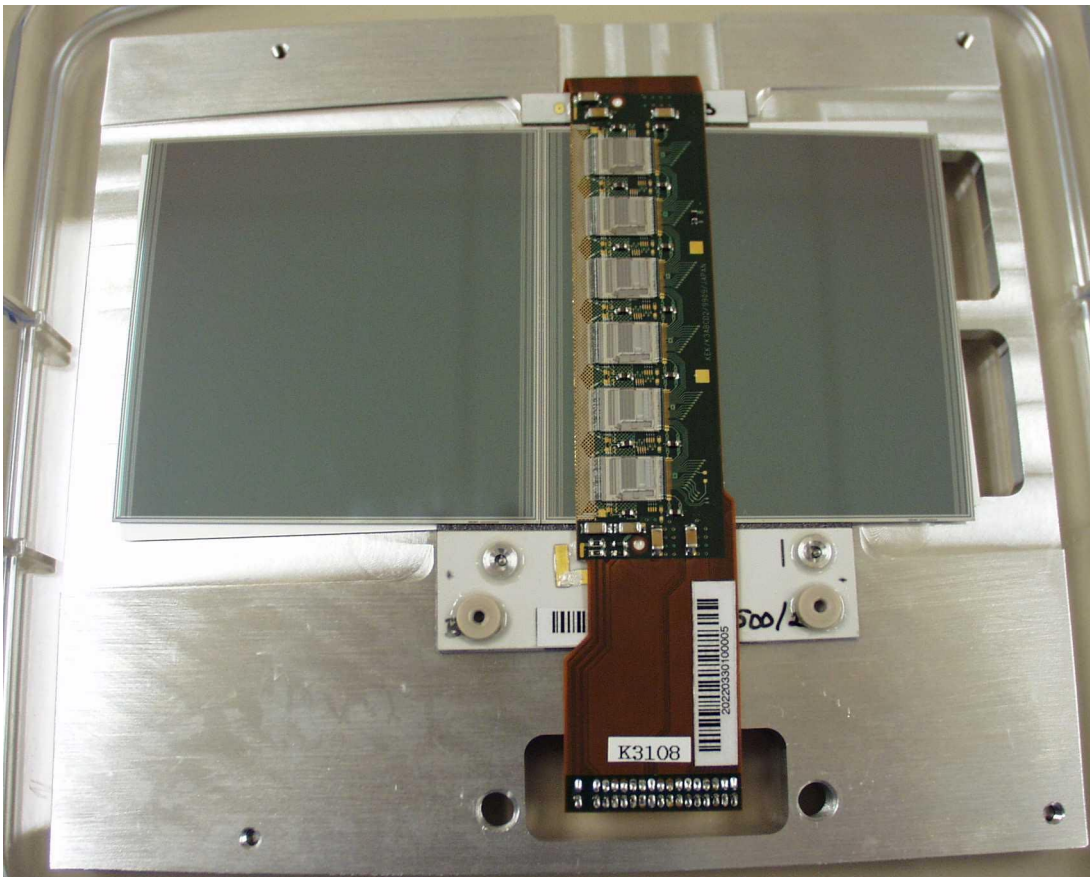
**ASIC attach:** Conductive epoxy

**Hybrid:** Cu/Polyimide/CC bridge version 3  
AGND, DGND split, with wire-bonds connection

**CC bridge:** Cu/Au metalization



6. PHOTOGRAPH

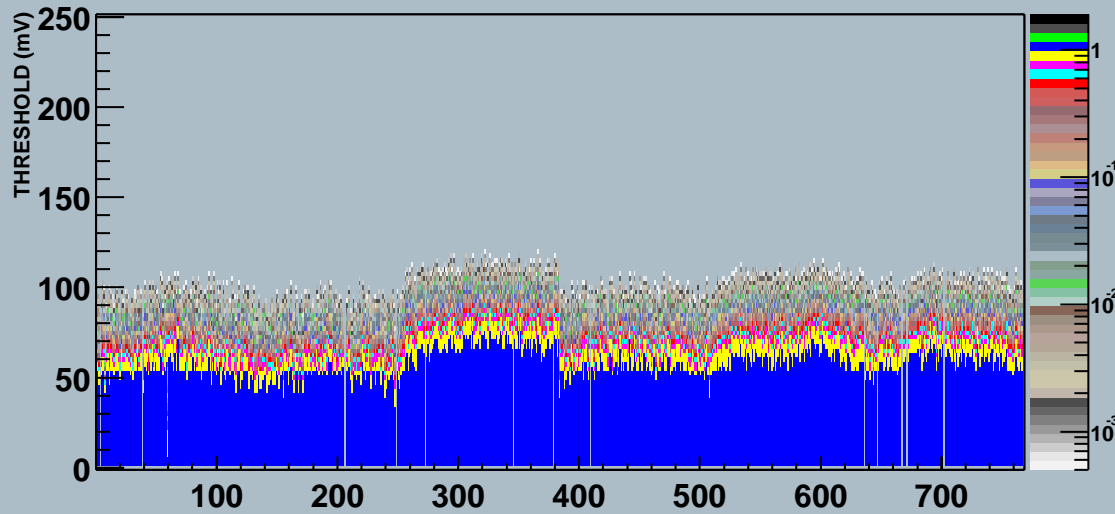


### ATLAS SCT Scan Comparison - log scale

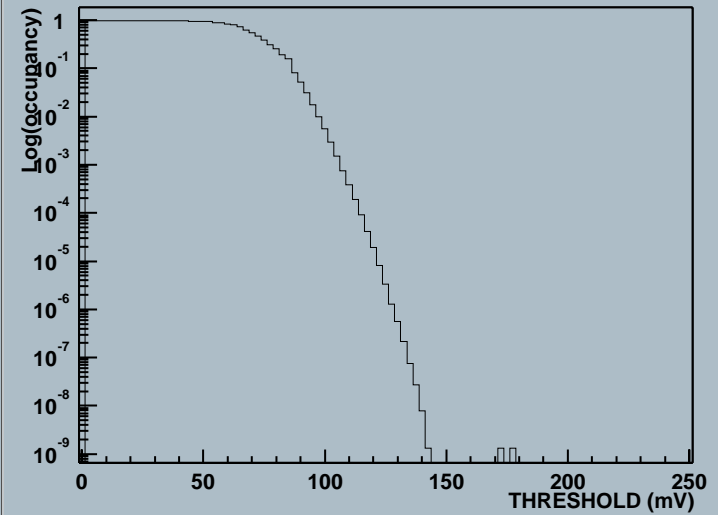
Run 1022 Scan 19 Module 0 Stream 0 (Projection of ch 0 to ch 768) vs

Run 1022 Scan 19 Module 0 Stream 1 (Projection of ch 0 to ch 768)

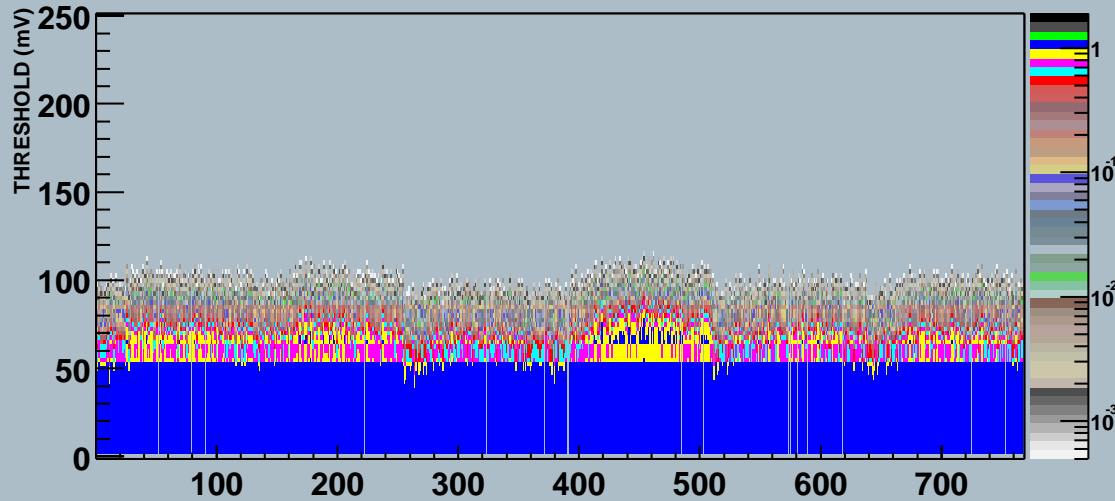
Module 0 rlk6 Stream 0 THRESHOLD (mV) Scan



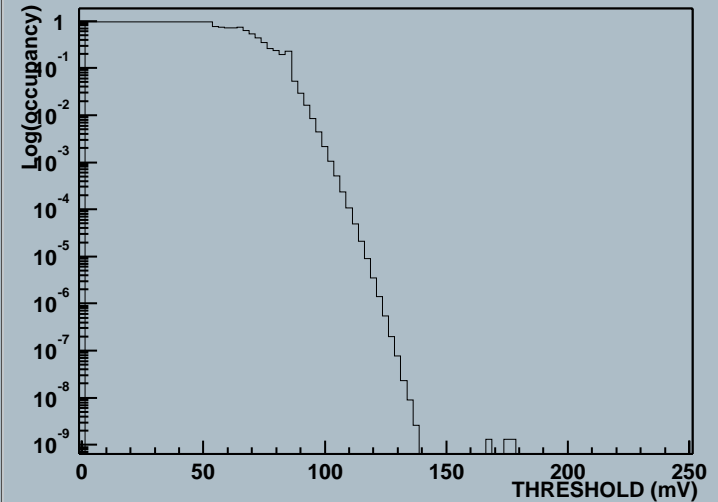
Module 0 rlk6 Stream 0 THRESHOLD (mV) Scan



Module 0 rlk6 Stream 1 THRESHOLD (mV) Scan



Module 0 rlk6 Stream 1 THRESHOLD (mV) Scan



# **k3107 module**

**Sensors:** Sintef ATLAS98  
285  $\mu\text{m}$  thickness  
<100> wafer

**ASICs:** ABCD2T  
Batch 30423 (2nd batch) , Wafer ?

**ASIC attach:** NON-conductive epoxy

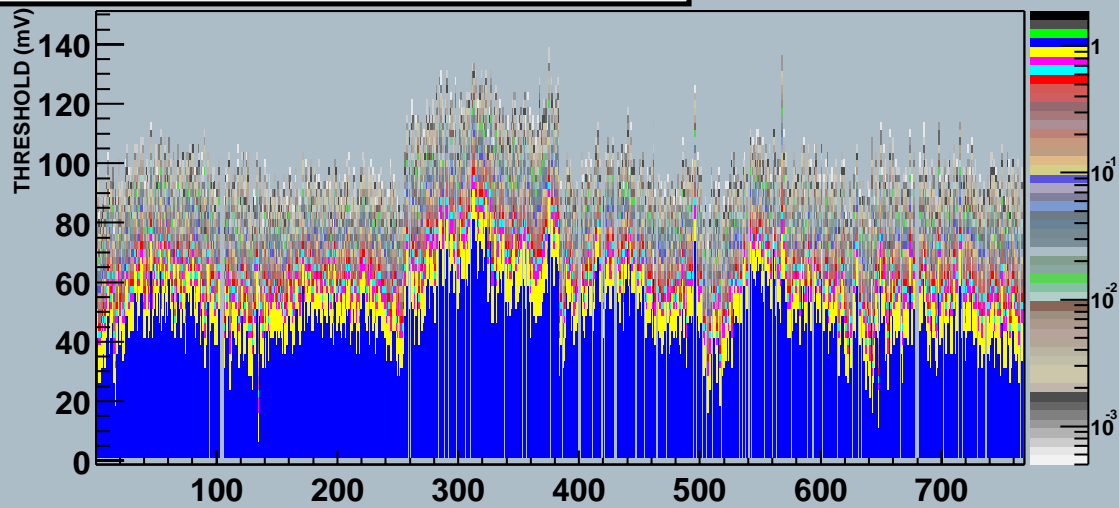
**Hybrid:** Cu/Polyimide/CC bridge version 3  
AGND, DGND split, with wire-bonds connection

**CC bridge:** Cu/Au metalization

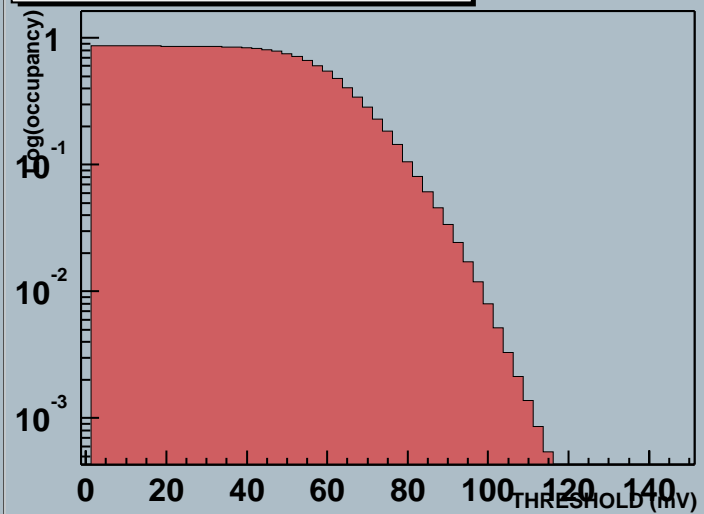
ATLAS SCT Scan Comparison - log scale

Run 747 Scan 4 Module 0 Stream 0 (Projection of ch 0 to ch 768) vs  
Run 747 Scan 5 Module 0 Stream 0 (Projection of ch 0 to ch 768)

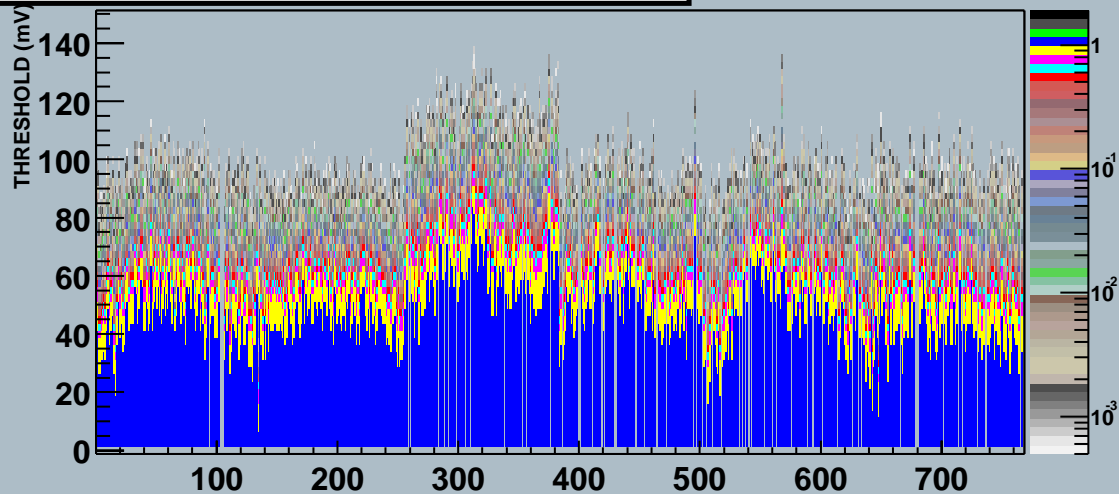
Module 0 scand1 Stream 0 THRESHOLD (mV) Scan



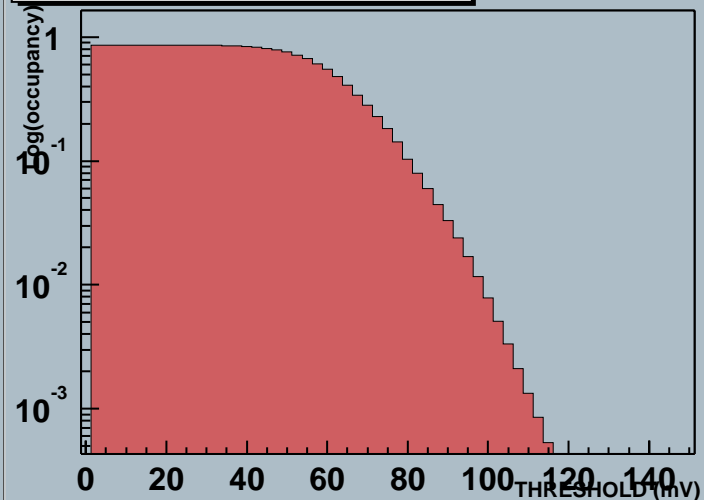
Module 0 scand1 Stream 0 THRESHOLD (mV) Scan



Module 0 scand1 Stream 0 THRESHOLD (mV) Scan



Module 0 scand1 Stream 0 THRESHOLD (mV) Scan

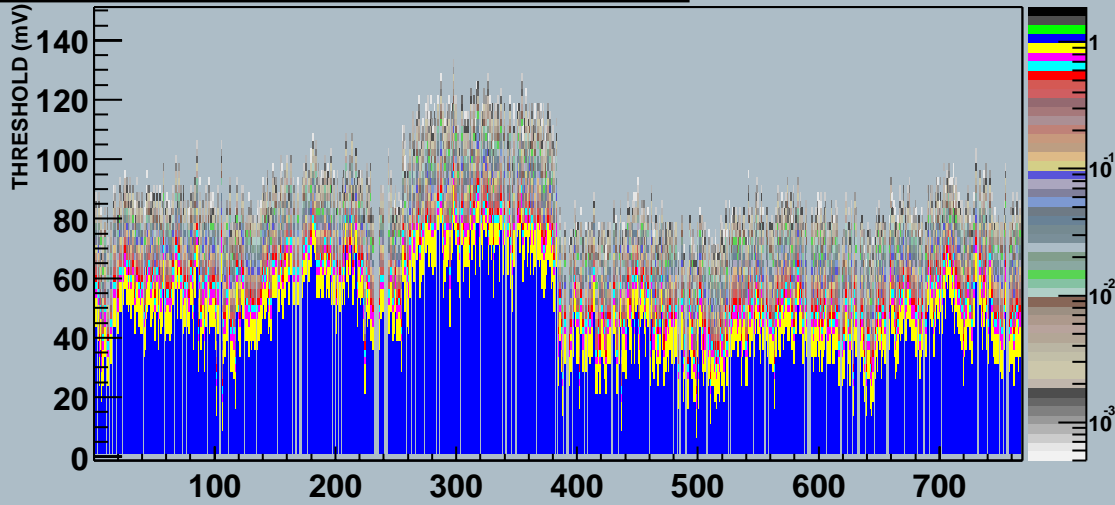


**ATLAS SCT Scan Comparison - log scale**

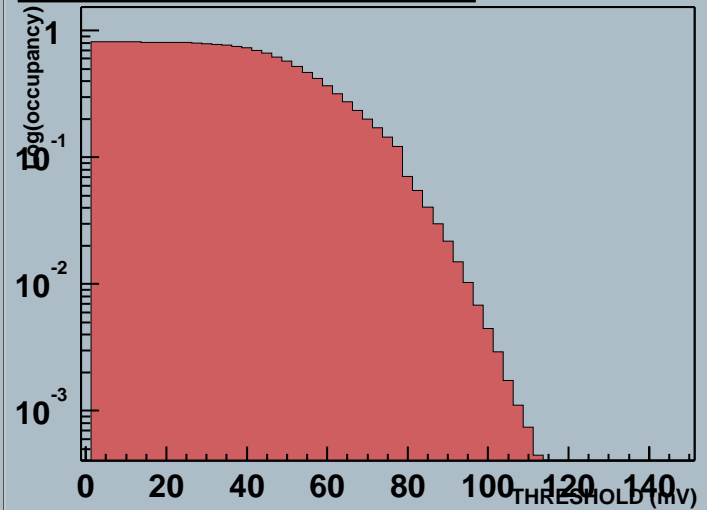
**Run 747 Scan 4 Module 0 Stream 1 (Projection of ch 0 to ch 768) vs**

**Run 747 Scan 5 Module 0 Stream 1 (Projection of ch 0 to ch 768)**

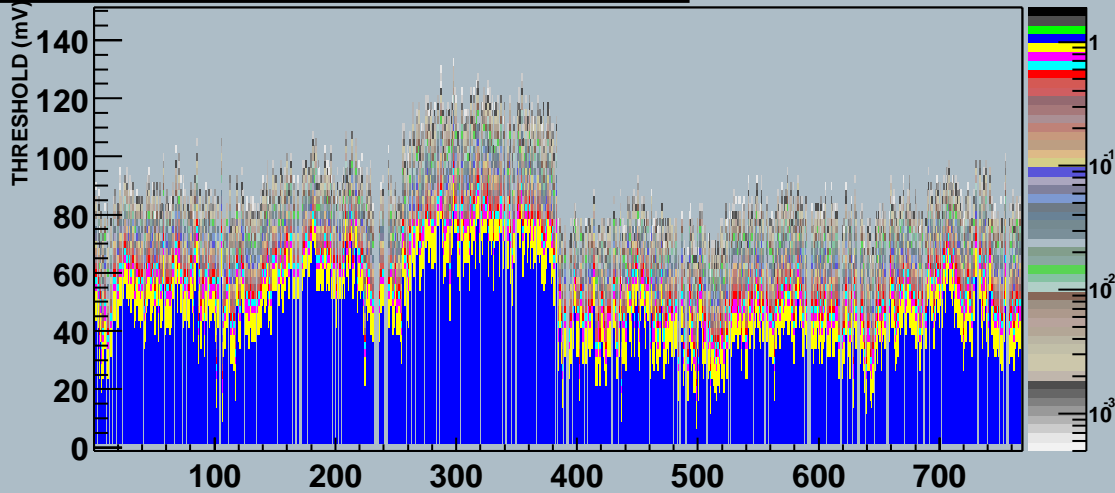
**Module 0 scand1 Stream 1 THRESHOLD (mV) Scan**



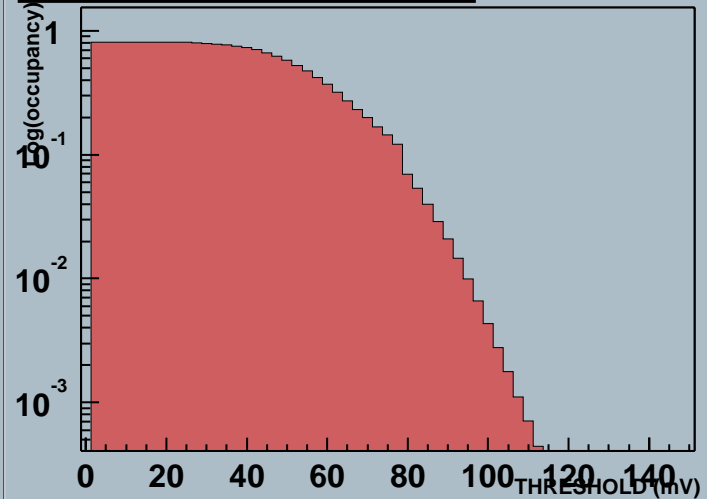
**Module 0 scand1 Stream 1 THRESHOLD (mV) Scan**



**Module 0 scand1 Stream 1 THRESHOLD (mV) Scan**



**Module 0 scand1 Stream 1 THRESHOLD (mV) Scan**



# Timewalk

- **Measured at**

- Threshold = 1fC
- Strobe delay scan for the calibration charges of 1.5, 2.0, 4.0, 6.0, 8.0, 16.0 fC
- Extract the strobe time of 50% efficiency
- (No fundamental reason to take the 50% point, just a technical easiness to extract a timing)

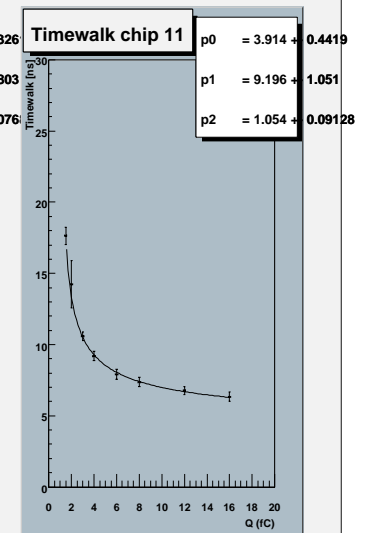
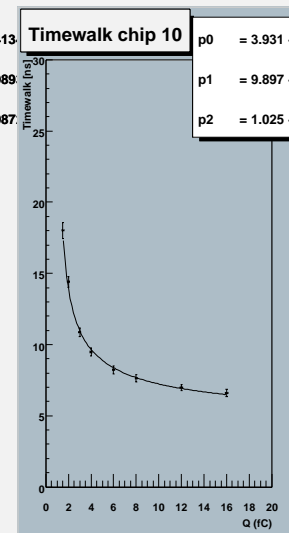
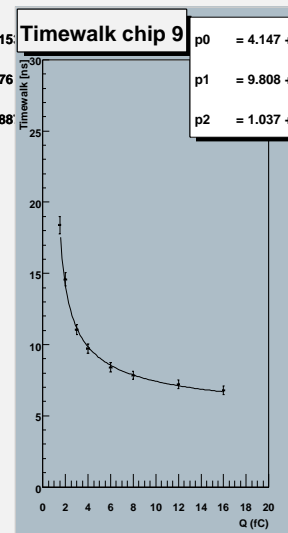
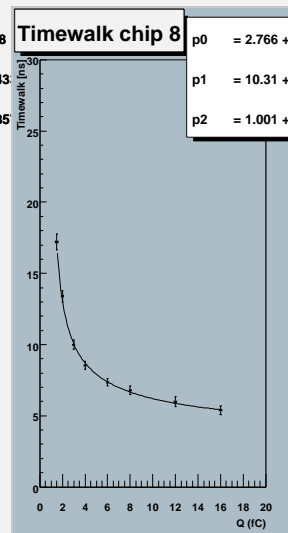
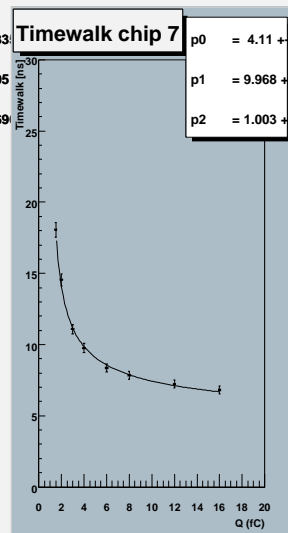
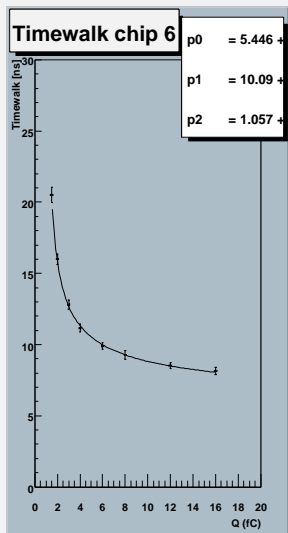
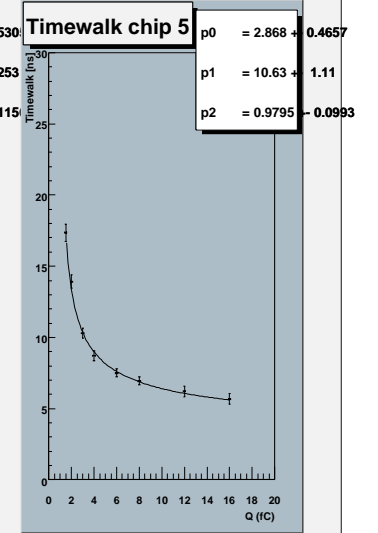
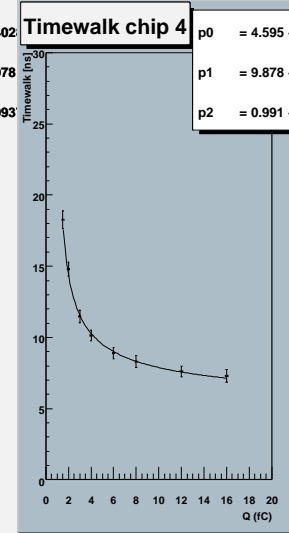
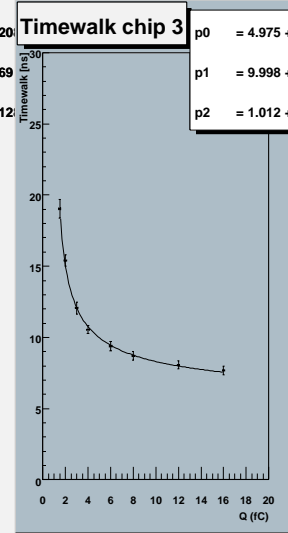
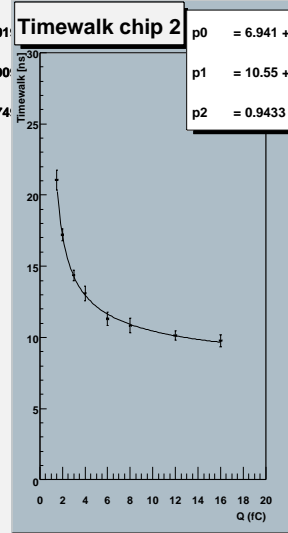
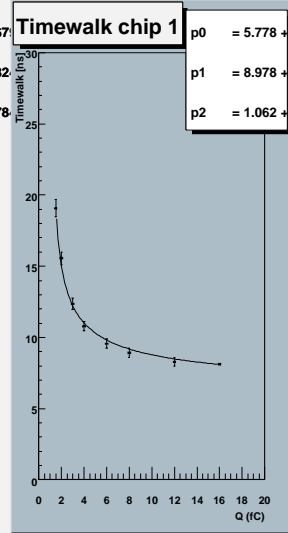
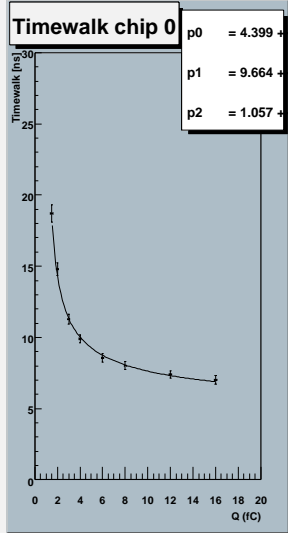
- **Reasonable fit with “inverse square root” function**

- $f(q) = p_0 + p_1/\sqrt{q - p_2}$
- In average,
- $p_1 \sim 10 \text{ ns}$
- $p_2 \sim 1 \text{ fC}$
- What does this mean?



# ATLAS SCT Module Timewalk Curve - ABCD2T - Inverse sqrt+ fit

Run 1443 Scans 1 - 9 Charges 1.50 - 16.00 fC Module 0 Stream 2



ATLAS SCT Module Test Report

MODULE NAME: k3103

DATABASE S/N:

1. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
Baseboard			Epoxy	Standard TPG baseboard

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pin holes	Comment
Top far	Hamamatsu	STX42454-1	143		0	ATLAS98 narrow m, 285
Top near	Hamamatsu	STX42454-3	180		0	ATLAS98 narrow m, 285
<b>Total</b>	-	-	263			-
Bottom far	Hamamatsu	STX42425-10	272		0	ATLAS98 wide poly, 285
Bottom near	Hamamatsu	STX42425-13	218		0	ATLAS98 wide poly, 285
<b>Total</b>	-	-	<b>813</b>		<b>0</b>	200V, 25 °C

	Database S/N	Manufacturer S/N	Comment
Hybrid		k3103	Barrel Cu/Polyimide flex v3

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset
M0		30423	3	1	7	0	0	1	59.4	-16.4
S1		30423	3	2	4	0	0	1	56.5	-2.7
S2		30423	3	2	14	0	0	1	61.1	-18.3
S3		30423	3	1	14	1	1	1	63.0	-13.5
S4		30423	3	1	6	1	1	2	62.0	-15.5
E5		30423	3	2	12	1	1	2	60.1	-16.8
M8		30423	3	1	11	0	0	1	57.6	-5.8
S9		30423	3	1	8	1	2	3	59.9	-7.3
S10		30423	3	2	7	1	1	3	60.2	-2.9
S11		30423	3	1	4	1	2	4	60.5	-18.3
S12		30423	3	2	13	1	1	6	61.4	-10.5
E13		30423	3	3	4	0	0	2	58.2	-5.7
<b>Total</b>	-	-	-	-	-	<b>7</b>	<b>9</b>	<b>27</b>	<60.0>	<-11.1>

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>			
HV decoupling	4	10	Murata	Murata GHM1530-B-103-K-630	70			
Large LV	4 * 2	330	Murata	Murata GRM42-6-X7R-334-K-25	15			
Small LV	7 * 2	100	Murata	Murata GRM39-X7R-104-K-25	26			
		nF			MHz			
<b>Total</b>	-	-	-	7	9	27	<60.0>	<-11.1>
Miscellaneous	Vendor	Part No.	Comment					
Temp. Sensors	-	-	not installed					

## 2. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	Ion-chemi	-	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Elec. Glue	Ion-chemi	-	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Therm. Glue			Araldite2011+BN

Bonding	#locations	# bonds / location	Comment
AG-DG connections	14	5	
Detector Backplane	2	2	Top side only
Strip Bias: detector to fanin	4	2	Top and bottom sides
Strip Bias: fanin to AG	4	2	Top and bottom sides

Were any components changed during production? If so, give brief details here:

### 3. OPERATING CONDITIONS

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Vcc</b>	3.5V	3.50	
<b>Vdd</b>	4.0V	4.00	
<b>Vdet</b>	100V	100	
<b>Icc</b>	-	0.92A	
<b>Idd</b>	-	0.42A	
<b>Idet</b>	-	~0.8uA	
<b>Bias Current</b>	267mA	267 uA	
<b>Shaper Current</b>	30mA	30 uA	
<b>Compression Mode</b>	1 (LEVEL XIX)	1	
<b>Edge Detect</b>	0 (OFF)	0	
<b>Box Grounding</b>	AG at PCB	DG at Patch	DG at Patch is done by design
<b>Box Cooling</b>	Fan	Fan	Climate box
<b>Module Temp</b>	< 45C	~25	module in a semi-confined box in above

### 4. TRIMMING

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Trim Method</b>	Minimisation of n Non Trim	Manual setting	Alternate: Minimisation of RMS
<b>Trim VCAL</b>		20 mV	
<b>Target Value</b>		200 mV	
<b>n Non Trim (link 0)</b>	-	10	
<b>n Non Trim (link 1)</b>	-	22	
<b>n Non Trim (total)</b>	-	32	
<b>RMS of vt50 distribution after trimming</b>	-	2.67, 2.76 mV	

## 5. RESULTS

	<b>M0</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	<b>E5</b>	<b>Link 0</b>	
<b>Gain (0,2,3fC lin)</b>	50.0	48.9	50.8	51.1	50.6	50.9	50.4	<b>mV/fC</b>
<b>Noise @2fC</b>	12.9	12.7	12.7	12.6	12.9	13.0	12.8	<b>mV</b>
<b>Noise @2fC</b>	.258	.261	.251	.247	.255	.256	.255	<b>fC</b>
<b>Noise @2fC</b>	1614	1629	1566	1541	1595	1600	1591±40	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	clean	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	104	106	101	98.5	105	100	102	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	6.4	6.7	6.8	6.5	6.6	6.5		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--	<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--	<b>fC</b>
<b>n Non Trim</b>	1	2	1	1	2	3	10	
<b>n Masked</b>	0	0	0	0	0	0		<b>-</b>

	<b>M8</b>	<b>S9</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>E13</b>	<b>Link 1</b>	<b>Overall</b>	
<b>Gain (0,2,3fC lin)</b>	48.1	48.3	51.2	48.3	50.8	48.9	49.3	49.9	<b>mV/fC</b>
<b>Noise @2fC</b>	12.4	12.7	12.7	13.0	13.3	13.3	12.9	12.9	<b>mV</b>
<b>Noise @2fC</b>	.257	.264	.249	.270	.262	.271	.262	.259	<b>fC</b>
<b>Noise @2fC</b>	1606	1648	1554	1686	1635	1696	1637±40	1614	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	clean	clean	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	106	108	98.9	108.1	101	107	104.8	103.4	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	6.1	6.2	6.6	6.2	6.9	6.6			<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>fC</b>
<b>n Non Trim</b>	0	2	2	2	5	11	22		
<b>n Masked</b>	0	0	0	0	0	0	0	0	<b>-</b>

ATLAS SCT Module Test Report

MODULE NAME: k3104

DATABASE S/N:

1. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
Baseboard			Epoxy	Standard TPG baseboard

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pin holes	Comment
Top far	Hamamatsu	STX42454-14	208		0	ATLAS98 narrow m, 285
Top near	Hamamatsu	STX37882-6	170		0	ATLAS98 narrow m, 285
<b>Total</b>	-	-	378			-
Bottom far	Hamamatsu	STX42456-6	142		0	ATLAS98 wide poly, 285
Bottom near	Hamamatsu	STX42456-8	141		0	ATLAS98 wide poly, 285
<b>Total</b>	-	-	<b>661</b>		<b>0</b>	200V, 25 °C

	Database S/N	Manufacturer S/N	Comment
Hybrid		k3103	Barrel Cu/Polyimide flex v3

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset
M0		30423	3	3	11	0	0	0	58.5	-6.4
S1		30423	3	2	3	0	0	1	61.9	-16.0
S2		30423	3	2	9	0	0	1	60.8	-5.7
S3		30423	3	2	15	0	0	1	62.3	-21.4
S4		30423	3	2	10	0	0	2	61.1	-8.5
E5		30423	3	2	2	1	1	2	61.2	-16.0
M8		30423	3	1	10	0	0	1	59.6	-3.3
S9		30423	3	0	11	2	2	2	58.5	-9.3
S10		30423	3	3	3	2	2	2	59.6	-13.4
S11		30423	3	2	16	1	1	3	64.2	-11.7
S12		30423	3	2	8	1	1	4	61.4	-8.9
E13		30423	3	3	5	2	2	5	57.1	-7.0
<b>Total</b>	-	-	-	-	-	<b>9</b>	<b>9</b>	<b>24</b>	<60.5>	<-10.6>

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>
HV decoupling	4	10	Murata	Murata GHM1530-B-103-K-630	70
Large LV	4 * 2	330	Murata	Murata GRM42-6-X7R-334-K-25	15
Small LV	7 * 2	100	Murata	Murata GRM39-X7R-104-K-25	26
		nF			MHz

Miscellaneous	Vendor	Part No.	Comment
Temp. Sensors	–	–	not installed

## 2. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Elec. Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Therm. Glue			Araldite2011+BN

Bonding	#locations	# bonds / location	Comment
AG-DG connections	14	5	
Detector Backplane	2	2	Top side only
Strip Bias: detector to fanin	4	2	Top and bottom sides
Strip Bias: fanin to AG	4	2	Top and bottom sides

Were any components changed during production? If so, give brief details here:

### 3. OPERATING CONDITIONS

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Vcc</b>	3.5V	3.50	
<b>Vdd</b>	4.0V	4.00	
<b>Vdet</b>	100V	100	
<b>Icc</b>	-	0.93A	
<b>Idd</b>	-	0.5A	
<b>Idet</b>	-	~0.8uA	
<b>Bias Current</b>	267mA	267 uA	
<b>Shaper Current</b>	30mA	30 uA	
<b>Compression Mode</b>	1 (LEVEL XIX)	1	
<b>Edge Detect</b>	0 (OFF)	0	
<b>Box Grounding</b>	AG at PCB	DG at Patch	DG at Patch is done by design
<b>Box Cooling</b>	Fan	Fan	Climate box
<b>Module Temp</b>	< 45C	~25	module in a semi-confined box in above

### 4. TRIMMING

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Trim Method</b>	Minimisation of n Non Trim	Manual setting	Alternate: Minimisation of RMS
<b>Trim VCAL</b>		20 mV	
<b>Target Value</b>		200 mV	
<b>n Non Trim (link 0)</b>	-	6	
<b>n Non Trim (link 1)</b>	-	12	
<b>n Non Trim (total)</b>	-	18	
<b>RMS of vt50 distribution after trimming</b>	-	2.76, 3.00 mV	



## 5. RESULTS

	<b>M0</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	<b>E5</b>	<b>Link 0</b>	
<b>Gain (0,2,3fC lin)</b>	49.1	50.0	52.0	52.3	49.2	48.8	50.2	<b>mV/fC</b>
<b>Noise @2fC</b>	12.0	12.7	12.8	1.28	12.2	12.2	12.5	<b>mV</b>
<b>Noise @2fC</b>	.245	.255	.246	.245	.245	.251	.248	<b>fC</b>
<b>Noise @2fC</b>	1526	1591	1542	1531	1549	1566	1551±40	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	clean	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	100.4	100.8	98.0	97.2	100.8	104.0	100.2	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	7.3	7.2	6.8	7.0	7.0	7.0		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--	<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--	<b>fC</b>
<b>n Non Trim</b>	0	1	1	1	1	2	6	
<b>n Masked</b>	0	0	0	0	0	0		<b>-</b>

	<b>M8</b>	<b>S9</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>E13</b>	<b>Link 1</b>	<b>Overall</b>	
<b>Gain (0,2,3fC lin)</b>	48.0	45.9	48.1	49.2	53.2	46.7	48.5	49.5	<b>mV/fC</b>
<b>Noise @2fC</b>	11.5	12.1	12.8	12.2	12.7	12.5	12.3	12.4	<b>mV</b>
<b>Noise @2fC</b>	0.240	0.264	0.266	0.247	0.239	0.268	0.254	0.251	<b>fC</b>
<b>Noise @2fC</b>	1497	1648	1664	1546	1495	1673	1587±40	1566	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	clean	clean	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	103.2	107.0	106.0	100.2	93.8	105.1	102.6	101.4	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	7.0	7.2	7.0	7.2	7.2	7.0			<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>fC</b>
<b>n Non Trim</b>	1	1	1	3	1	5	12	18	
<b>n Masked</b>	0	0	0	0	0	0	0	0	<b>-</b>

ATLAS SCT Module Test Report

MODULE NAME: k3111

DATABASE S/N:

1. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
Baseboard			Epoxy	Standard TPG baseboard

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pin holes	Comment
Top far	Hamamatsu	STX42454-6	170		0	ATLAS98 narrow m, 285
Top near	Hamamatsu	STX42454-8	161		0	ATLAS98 narrow m, 285
<b>Total</b>	-	-	331			-
Bottom far	Hamamatsu	STX42454-11	173		0	ATLAS98 narrow m, 285
Bottom near	Hamamatsu	STX424254-12	187		0	ATLAS98 narrow m, 285
<b>Total</b>	-	-	<b>691</b>		<b>0</b>	200V, 25 °C

	Database S/N	Manufacturer S/N	Comment
Hybrid		k3111	Barrel Cu/Polyimide flex v3/Polymer-coated bridges

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset	qfactor
M0		29476	15	2	5	0	0	5	55.4	10.1	7.5
S1		29476	15	6	6	0	0	8	55.4	5.5	5.8
S2		29476	15	2	3	1	1	2	55.8	6.6	8.2
S3		29476	15	2	7	0	0	0	56.2	5.9	5.1
S4		29476	15	6	2	1	1	13	54.9	7.7	8.6
E5		29476	15	5	11	0	0	15	55.8	9.1	5.1
M8		29476	15	0	12	1	1	2	59.3	8.1	7.5
S9		29476	15	1	12	2	2	3	59.1	2.7	5.3
S10		29476	15	1	10	0	0	2	56.8	5.6	7.1
S11		29476	15	1	7	1	1	3	56.9	5.4	7.4
S12		29476	15	6	10	1	1	4	57.4	10.2	4.6
E13		29476	15	5	6	0	0	20	56.5	2.6	7.0
<b>Total</b>	-	-	-	-	-	<b>7</b>	<b>7</b>	<b>77</b>	<56.5>	<6.6>	<6.6>

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>
HV decoupling	4	10	Murata	Murata GHM1530-B-103-K-630	70
Large LV	4 * 2	330	Murata	Murata GRM42-6-X7R-334-K-25	15
Small LV	7 * 2	100	Murata	Murata GRM39-X7R-104-K-25	26
		nF			MHz

Miscellaneous	Vendor	Part No.	Comment
Temp. Sensors	Semitec	103KT1608-1P	

## 2. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Elec. Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Therm. Glue			Araldite2011+BN

Bonding	#locations	# bonds / location	Comment
AG-DG connections	14	5	
Detector Backplane	2	2	Top side only
Strip Bias: detector to fanin	4	2	Top and bottom sides
Strip Bias: fanin to AG	4	2	Top and bottom sides

Were any components changed during production? If so, give brief details here:

### 3. OPERATING CONDITIONS

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Vcc</b>	3.5V	3.50	
<b>Vdd</b>	4.0V	4.00	
<b>Vdet</b>	100V	100	
<b>Icc</b>	-	0.89A	
<b>Idd</b>	-	0.47A	
<b>Idet</b>	-	~0.8uA	
<b>Bias Current</b>	267mA	267 uA	
<b>Shaper Current</b>	30mA	30 uA	
<b>Compression Mode</b>	1 (LEVEL XIX)	1	
<b>Edge Detect</b>	0 (OFF)	0	
<b>Box Grounding</b>	AG at PCB	DG at Patch	DG at Patch is done by design
<b>Box Cooling</b>	Fan	Fan	Climate box
<b>Module Temp</b>	< 45C	~25	module in a semi-confined box in above

### 4. TRIMMING

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Trim Method</b>	Minimisation of n Non Trim	Manual setting	Alternate: Minimisation of RMS
<b>Trim VCAL</b>		20 mV	
<b>Target Value</b>		200 mV	
<b>n Non Trim (link 0)</b>	-	38	
<b>n Non Trim (link 1)</b>	-	37	
<b>n Non Trim (total)</b>	-	75	
<b>RMS of vt50 distribution after trimming</b>	-	2.94, 2.91 mV	

## 5. RESULTS

	<b>M0</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	<b>E5</b>	<b>Link 0</b>	
<b>Gain (0,2,3fC lin)</b>	54.0	51.7	54.2	53.8	51.7	53.3	53.1	<b>mV/fC</b>
<b>Noise @2fC</b>	12.0	12.1	12.6	12.1	12.5	12.0	12.2	<b>mV</b>
<b>Noise @2fC</b>	0.223	0.233	0.233	0.224	0.241	0.225	0.230	<b>fC</b>
<b>Noise @2fC</b>	1392	1457	1455	1400	1509	1408	1437	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	discontinuity	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	86.9	96.7	90.4	90.5	94.0	89.1	91.3	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	7.3	6.5	6.5	6.8	7.2	7.3		<b>mV</b>
<b>Stability - Offset</b>	-	-	-	-	-	-9	-	<b>mV</b>
<b>Stability - Offset</b>	-	-	-	-	-	-0.17	-	<b>fC</b>
<b>n Non Trim</b>	4	9	3	1	11	10	38	
<b>n Masked</b>	0	0	0	0	0	0		<b>-</b>

	<b>M8</b>	<b>S9</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>E13</b>	<b>Link 1</b>	<b>Overall</b>	
<b>Gain (0,2,3fC lin)</b>	56.8	54.7	52.7	54.3	54.3	51.1	54.0	53.6	<b>mV/fC</b>
<b>Noise @2fC</b>	12.2	12.0	12.0	12.2	12.5	12.1	12.2	12.2	<b>mV</b>
<b>Noise @2fC</b>	0.215	0.220	0.227	0.225	0.230	0.236	0.225	0.228	<b>fC</b>
<b>Noise @2fC</b>	1345	1374	1418	1408	1435	1477	1409	1423	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	discontinuity	clean	clean		<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	80.0	86.6	88.9	88.2	86.6	92.3	87.1		<b>mV</b>
<b>RMS of dist. of NO offsets</b>	6.6	7.1	6.6	7.0	7.3	7.2			<b>mV</b>
<b>Stability - Offset</b>	-	-	-	-	-7	-	-		<b>mV</b>
<b>Stability - Offset</b>	-	-	-	-	-0.13	-	-		<b>fC</b>
<b>n Non Trim</b>	2	2	2	3	9	19	37	75	
<b>n Masked</b>	0	0	0	0	0	0	0	0	<b>-</b>

# ATLAS SCT Module Test Report

MODULE NAME: k3112

DATABASE S/N:

## 1. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
Baseboard			Epoxy	Standard TPG baseboard

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pin holes	Comment
Top far	20220900200126	SRN39255-126	155		0	ATLAS98 wide m 100, 287um
Top near	20220900200127	SRN39255-127	158		0	ATLAS98 wide m 100, 287um
<b>Total</b>	-	-	303			-
Bottom far	20220900200131	SRN39255-131	178		6*	ATLAS98 wide m 100, 287um
Bottom near	20220900200129	SRN39255-129	152		0	ATLAS98 wide m 100, 287um
<b>Total</b>	-	-	<b>633</b>		<b>0</b>	350V, 27 °C

6\*: strip#32-#37 metal short

	Database S/N	Manufacturer S/N	Comment
Hybrid		k3112	Barrel Cu/Polyimide flex v3/Polymer-coated bridges

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset	qfactor
M0		29476	15	2	8		2	3	55.8	0.0	6.7
S1		29476	15	3	12		0	8	56.7	-1.2	5.8
S2		29476	15	2	6		0	3	57.0	5.4	8.2
S3		29476	15	2	12		0	2	57.3	2.3	6.1
S4		29476	15	3	9		0	13	56.0	-0.4	6.0
E5		29476	15	5	5		0	15	56.2	5.7	5.3
M8		29476	15	5	18		0	9	59.4	9.3	7.4
S9		29476	15	5	13		1	10	56.9	-1.4	5.1
S10		29476	15	2	17		0	2	58.1	5.9	6.0
S11		29476	15	1	9		0	2	58.3	4.1	6.6
S12		29476	15	6	11		1	14	57.3	7.0	5.6
E13		29476	15	5	12		0	22	56.3	8.4	5.5
<b>Total</b>	-	-	-	-	-		<b>4</b>	<b>103</b>	<57.1>	<3.8>	<6.2>

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>
HV decoupling	4	10	Murata	Murata GHM1530-B-103-K-630	70
Large LV	4 * 2	330	Murata	Murata GRM42-6-X7R-334-K-25	15
Small LV	7 * 2	100	Murata	Murata GRM39-X7R-104-K-25	26
		nF			MHz

Miscellaneous	Vendor	Part No.	Comment
Temp. Sensors	Semitec	103KT1608-1P	

## 2. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Elec. Glue	Ion-chemi	–	Silver-loaded, RT-cure, 50°C 2hr post-cure
Det. Therm. Glue			Araldite2011+BN

Bonding	#locations	# bonds / location	Comment
AG-DG connections	14	5	
Detector Backplane	2	2	Top side only
Strip Bias: detector to fanin	4	2	Top and bottom sides
Strip Bias: fanin to AG	4	2	Top and bottom sides

Were any components changed during production? If so, give brief details here:

### 3. OPERATING CONDITIONS

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Vcc</b>	3.5V	3.50	
<b>Vdd</b>	4.0V	4.00	
<b>Vdet</b>	100V	100	
<b>Icc</b>	-	0.90A	
<b>Idd</b>	-	0.46A	
<b>Idet</b>	-	~0.6uA	
<b>Bias Current</b>	267mA	267 uA	
<b>Shaper Current</b>	30mA	30 uA	
<b>Compression Mode</b>	1 (LEVEL XIX)	0	
<b>Edge Detect</b>	0 (OFF)	0	
<b>Box Grounding</b>	AG at PCB	DG at Patch	DG at Patch is done by design
<b>Box Cooling</b>	Fan	Fan	Climate box
<b>Module Temp</b>	< 45C	~25	module in a semi-confined box in above

### 4. TRIMMING

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Trim Method</b>	Minimisation of n Non Trim	Manual setting	Alternate: Minimisation of RMS
<b>Trim VCAL</b>		20 mV	
<b>Target Value</b>		200 mV	
<b>n Non Trim (link 0)</b>	-	40	
<b>n Non Trim (link 1)</b>	-	53	
<b>n Non Trim (total)</b>	-	93	
<b>RMS of vt50 distribution after trimming</b>	-	2.98, 3.19 mV	



## 5. RESULTS

	<b>M0</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	<b>E5</b>	<b>Link 0</b>	
<b>Gain (0,2,3fC lin)</b>	53.6	54.0	57.5	55.4	53.2	55.3	54.8	<b>mV/fC</b>
<b>Noise @2fC</b>	12.5	112.6	12.6	12.8	12.7	12.7	12.6	<b>mV</b>
<b>Noise @2fC</b>	0.233	0.233	0.220	0.231	0.238	0.229	0.231	<b>fC</b>
<b>Noise @2fC</b>	1455	1458	1373	1446	1487	1433	1442	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	*disconti ~80mV	clean	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	96.8	95.0	85.8	92.4	98.4	94.7	93.8	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	6.9	7.1	6.9	7.2	6.9	6.8		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	-15	--	<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	-0.27	--	<b>fC</b>
<b>n Non Trim</b>	6	7	3	3	9	12	40	
<b>n Masked</b>	0	0	0	0	0	0		<b>-</b>

\*discontinuity: also observed in standalone hybrid

	<b>M8</b>	<b>S9</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>E13</b>	<b>Link 1</b>	<b>Overall</b>	
<b>Gain (0,2,3fC lin)</b>	59.7	51.3	57.3	57.3	56.2	55.0	56.1	55.5	<b>mV/fC</b>
<b>Noise @2fC</b>	13.0	12.8	12.8	13.0	13.1	12.9	12.9	12.8	<b>mV</b>
<b>Noise @2fC</b>	0.218	0.249	0.223	0.227	0.232	0.234	0.231	0.231	<b>fC</b>
<b>Noise @2fC</b>	1365	1557	1393	1419	1452	1462	1441	1442	<b>ENC</b>
<b>Stability point</b>	clean	clean	clean	clean	clean	clean	clean		<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	81.4	99.9	84.6	86.5	90.3	90.6	88.9	91.4	<b>mV</b>
<b>RMS of dist. of NO offsets</b>	7.5	7.3	7.4	7.8	4.3	7.8			<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>mV</b>
<b>Stability - Offset</b>	--	--	--	--	--	--	--		<b>fC</b>
<b>n Non Trim</b>	8	8	1	2	17	17	53	93	
<b>n Masked</b>	0	0	0	0	0	0	0	0	<b>-</b>

# ATLAS SCT Module Test Report

MODULE NAME: **RLK6**

DATABASE S/N: **20220330100005**

## 1. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
<b>Baseboard</b>	20220990000130		Poly	

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pin holes	Comment
<b>Top far</b>	20220990000218	STX42503-1		~0.8pF/cm		Hamamatsu 285 um wide poly
<b>Top near</b>	20220990000219	STX42503-2		~0.8pF/cm		Wide poly
<b>Total</b>	-	-				-
<b>Bottom far</b>	20220990000220	STX42503-3		~0.8pF/cm		Hamamatsu 285 um wide poly
<b>Bottom near</b>	20220990000221	STX42503-7		~0.8pF/cm		Wide poly
<b>Total</b>	-	-				-

	Database S/N	Manufacturer S/N	Comment
<b>Hybrid</b>		k3108	KEK Kapton v3

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset
<b>M0</b>		29476	16	0	10	1	1	2	60.1	7.8
<b>S1</b>		29476	16	0	11	2	2	5	59.6	11.2
<b>S2</b>		29476	16	1	4	2	2	4	56.8	0.8
<b>S3</b>		29476	16	1	11	2	2	5	58.0	7.9
<b>S4</b>		29476	16	2	4	2	2	3	56.3	5.2
<b>E5</b>		29476	16	2	9	2	1	2	55.0	3.3
<b>M8</b>		29476	16	2	11	1	1	9	56.4	0.9
<b>S9</b>		29476	16	2	13	1	1	2	57.4	2.6
<b>S10</b>		29476	16	2	15	2	1	3	58.7	3.4
<b>S11</b>		29476	16	3	1	0	0	5	54.4	2.9
<b>S12</b>		29476	16	3	14	0	0	8	56.1	2.8
<b>E13</b>		29476	16	3	15	1	1	2	57.1	6.7
<b>Total</b>	-	-	-	-	-	<b>16</b>	<b>14</b>	<b>50</b>	-	-

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>
HV decoupling	4	10			
Large LV	4 * 2	330			
Small LV	14 * 2	100			
		nF			MHz

Miscellaneous	Vendor	Part No.	Comment
Temp. Sensors	Semitec		2 off 10k NTC thermistor

## 2. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	EPOTEK	H20F	
Det. Elec. Glue	RS components	186-3616	
Det. Therm. Glue			2011 + Boron Nitride

Bonding	#locations	# bonds / location	Comment
AG-DG connections	7 * 2	2?	To be confirmed
Detector Backplane	2	2	
Strip Bias: detector to fanin	4	2?	To be confirmed
Strip Bias: fanin to AG	4	1?	To be confirmed

Were any components changed during production? If so, give brief details here:

N/A

### 3. OPERATING CONDITIONS

	Default	Actual	Comment
Vcc	3.5V		
Vdd	4.0V		
Vdet	100V		
Icc	-		
Idd	-		
Idet	-	660nA	@ 22.5C
Bias Current	267mA	267mA	
Shaper Current	30mA	30mA	
Compression Mode	1 (LEVEL XIX)	1 (LEVEL XIX)	
Edge Detect	0 (OFF)	0 (OFF)	
Box Grounding	AG at PCB	AG at PCB	
Box Cooling	Fan	Fan + Granite	
Module Temp	< 45C	30.5C, 29.3C	Hybrid thermistors top/bottom

### 4. TRIMMING

	Default	Actual	Comment
Trim Method	Minimisation of n Non Trim	Minimisation of n Non Trim	Alternate: Minimisation of RMS
Trim VCAL		12.5	
Target Value		120	
n Non Trim (link 0)	-	28	
n Non Trim (link 1)	-	23	
n Non Trim (total)	-	51	
RMS of vt50 distribution after trimming	-		

## 5. RESULTS

	M0	S1	S2	S3	S4	E5	Link 0	
<b>Gain (2fC to 3fC)</b>	65	65	65	64	64	64	64	<b>MV/fC</b>
<b>Noise @2fC</b>	14	14	13	14	14	13	13	<b>mV</b>
<b>Noise @ 2fC</b>	0.21	0.21	0.21	0.21	0.22	0.21	0.21	<b>fC</b>
<b>Noise @ 2fC</b>	1340	1330	1300	1340	1370	1300	1330	<b>ENC</b>
<b>Stability point</b>	<offset	<offset	<offset	<offset	<offset	<offset	<offset	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	65	61	83	68	76	74	71	<b>mV</b>
<b>RMS of dist. of NO offsets</b>								<b>mV</b>
<b>Stability - Offset</b>	<0	<0	<0	<0	<0	<0	<0	<b>mV</b>
<b>Stability - Offset</b>	<0	<0	<0	<0	<0	<0	<0	<b>fC</b>
<b>n Non Trim</b>	4	7	4	2	3	8	28	-
<b>n Masked</b>	4	7	4	2	3	8	28	-

	M8	S9	S10	S11	S12	E13	Link 1	Overall	
<b>Gain (2fC to 3fC)</b>	63	63	64	63	61	64	63	64	<b>mV/fC</b>
<b>Noise @2fC</b>	13	14	13	13	13	13	13	13	<b>mV</b>
<b>Noise @ 2fC</b>	0.21	0.21	0.21	0.21	0.22	0.21	0.21	0.21	<b>fC</b>
<b>Noise @ 2fC</b>	1330	1340	1290	1290	1360	1320	1320	1330	<b>ENC</b>
<b>Stability point</b>	85	85	85	85	85	85	85	85	<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	72	73	64	77	68	68	71	71	<b>mV</b>
<b>RMS of dist. of NO offsets</b>									<b>mV</b>
<b>Stability - Offset</b>	13	12	21	8	17	17	14	14	<b>mV</b>
<b>Stability - Offset</b>	0.2	0.2	0.3	0.1	0.3	0.3	0.2	0.2	<b>fC</b>
<b>n Non Trim</b>	5	4	2	4	6	2	23	51	-
<b>n Masked</b>	5	4	2	4	6	2	23	51	-

## 1. ATLAS SCT Module Test Report

MODULE NAME: Scand-1

DATABASE S/N:

## 2. COMPONENTS

	Database S/N	Manufacturer S/N	Encapsulant	Comment
Baseboard	20220990000125	MET 18	Epoxy	

Detectors	Database S/N	Manufacturer S/N	I <sub>leakage</sub> (nA)	C <sub>interstrip</sub> (pF)	Pinholes	Comment
Top far		SINTEF				
Top near		SINTEF				
Total	-	-				-
Bottom far		SINTEF				
Bottom near		SINTEF				
Total	-	-				-

	Database S/N	Manufacturer S/N	Comment
Hybrid		K3107	

Chips	Database S/N	Batch	Wafer	X	Y	x <sub>eff</sub>	nDead	Non Trim	Gain	Offset
M0		30423	6	1	9	1	1	0	58	1.9
S1		30423	6	1	7	1	2	2	61	-15.5
S2		30423	6	1	6	1	1	25	61	-15.3
S3		30423	5	7	9	0	0	29	62	-7.2
S4		30423	5	7	8	0	0	30	60	-6.0
E5		30423	5	6	12	2	2	33	63	-13.0
M8		30423	5	6	11	0	0	25	61	-2.4
S9		30423	5	6	10	0	0	30	59	-10.8
S10		30423	5	6	9	2	2	30	65	-28.2
S11		30423	5	6	8	0	0	35	60	6.4
S12		30423	5	6	7	2	2	128	60	0.1
E13		30423	5	6	5	1	1	25	59	1.9
Total	-	-	-	-	-				-	-

Capacitors	#locations	C	Vendor	Part No.	F <sub>Resonance</sub>
HV decoupling	4	10	?		
Large LV	4 * 2	220	MuRata		
Small LV	7 * 2	100	MuRata		
		nF			MHz

Miscellaneous	Vendor	Part No.	Comment
Temp. Sensors			PT1000

### 3. CONSTRUCTION DETAILS

Adhesives	Vendor	Part No.	Comment
Chip Glue	Araldite + boronnitrite		Not electrically conducting
Det. Elec. Glue	Chemtronics CW2400		
Det. Therm. Glue	Araldite + boronnitrite		

### 4.

Bonding	#locations	# bonds / location	Comment
AG-DG connections	14	3	
Detector Backplane	1	3	
Strip Bias: detector to fanin			
Strip Bias: fanin to AG	24	2	

Were any components changed during production? If so, give brief details here:

## 5. OPERATING CONDITIONS

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Vcc</b>	3.5V	3.5V	
<b>Vdd</b>	4.0V	4.0V	
<b>Vdet</b>	100V	100V	
<b>Icc</b>	-	460mA	
<b>Idd</b>	-	500mA	
<b>Idet</b>	-	20nA	
<b>Bias Current</b>	267mA	267mA	
<b>Shaper Current</b>	30mA	30mA	
<b>Compression Mode</b>	1 (LEVEL XIX)	1 (LEVEL XIX)	
<b>Edge Detect</b>	0 (OFF)	0 (OFF)	
<b>Box Grounding</b>	AG at PCB	DG at PCB	
<b>Box Cooling</b>	Fan	-25 °C freezer	
<b>Module Temp</b>	< 45C	-20 °C	

6.

## 7. TRIMMING

	<b>Default</b>	<b>Actual</b>	<b>Comment</b>
<b>Trim Method</b>	Minimisation of n Non Trim	Minimisation of n Non Trim	Alternate: Minimisation of RMS
<b>Trim VCAL</b>	-	20	
<b>Target Value</b>	-	135	
<b>n Non Trim (link 0)</b>	-	104	
<b>n Non Trim (link 1)</b>	-	143	
<b>n Non Trim (total)</b>	-	247	
<b>RMS of vt50 distribution after trimming</b>	-	5.6 mV (link 0) 5.6 mV (link 1)	

## 8. RESULTS



9.

	M0	S1	S2	S3	S4	E5	Link 0	
<b>Gain (0fC, 2fC &amp; 3fC)</b>	59	58	61	61	58	59	59.3	<b>mV/fC</b>
<b>Noise @ 2fC</b>	12	11.8	14.8	12.3	12.0	15.2	13.0	<b>mV</b>
<b>Noise @ 2fC</b>	0.20	0.21	0.24	0.20	0.21	0.22	0.22	<b>fC</b>
<b>Noise @ 2fC</b>	1260	1280	1510	1265	1290	1385	1370	<b>ENC</b>
<b>Stability point</b>								<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	53	52	70	56	53	52		<b>mV</b>
<b>RMS of dist. of NO offsets</b>	7.8	6.3	14.0	11.1	13.7	12.7		<b>mV</b>
<b>Stability - Offset</b>								<b>mV</b>
<b>Stability - Offset</b>								<b>fC</b>
<b>n Non Trim</b>	6	0	17	25	29	27	104	
<b>n Masked</b>	6	0	17	25	29	27	104	<b>-</b>

	M8	S9	S10	S11	S12	E13	Link 1	Overall	
<b>Gain (0fC, 2fC &amp; 3fC)</b>	59	58	59	62	58	57	58.8		<b>mV/fC</b>
<b>Noise @ 2fC</b>	12.1	12.0	14.6	11.7	12.1	11.7	12.4		<b>mV</b>
<b>Noise @ 2fC</b>	0.20	0.21	0.25	0.18	0.21	0.21	0.21		<b>fC</b>
<b>Noise @ 2fC</b>	1270	1290	1535	1180	1300	1295	1310		<b>ENC</b>
<b>Stability point</b>									<b>mV</b>
<b>Offset (by Noise Occupancy)</b>	47	54	70	41	42	43			<b>mV</b>
<b>RMS of dist. of NO offsets</b>	13.0	11.4	15.1	10.7	9.0	14.5			<b>mV</b>
<b>Stability - Offset</b>									<b>mV</b>
<b>Stability - Offset</b>									<b>fC</b>
<b>n Non Trim</b>	23	28	22	26	24	20	143		
<b>n Masked</b>	23	28	22	26	24	20	143		<b>-</b>