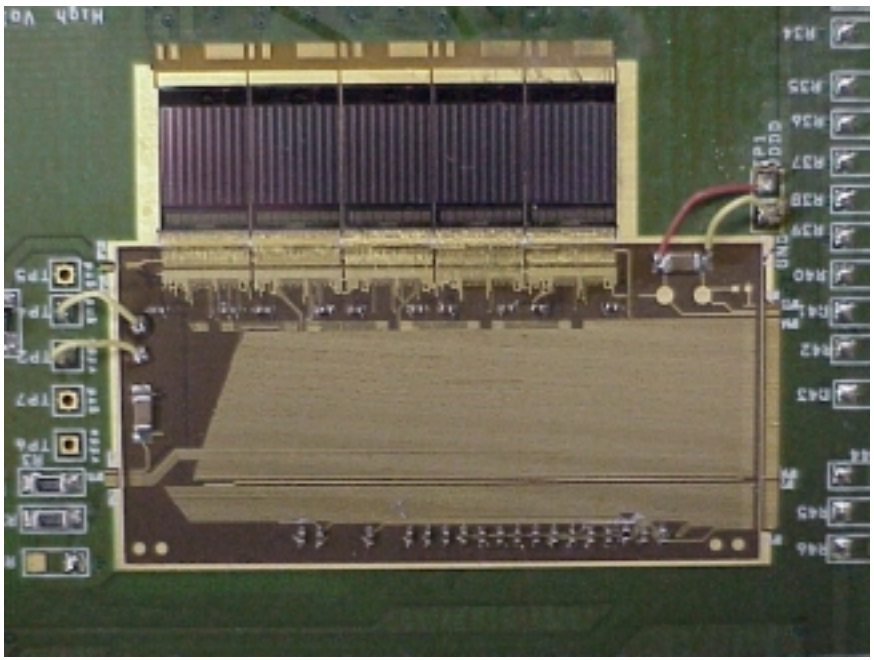
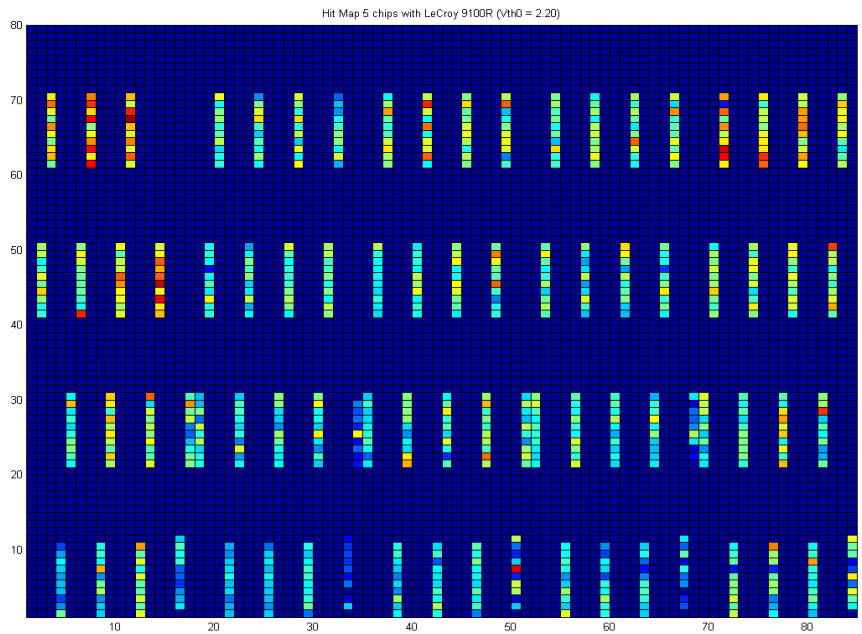
Pixel Activities

- Threshold and noise characterization of board with 5 FPIX1 bare dies with two different pulse generators;
- Threshold and noise characterization of board with 1 FPIX1 bare die;
- Radioactive Source hit map with ATLAS sensors;
- Threshold and noise characterization of board with 5 FPIX1 bare dies bump bonded to ATLAS sensors;
- Characterization of threshold with injection of charge in different points of readout.

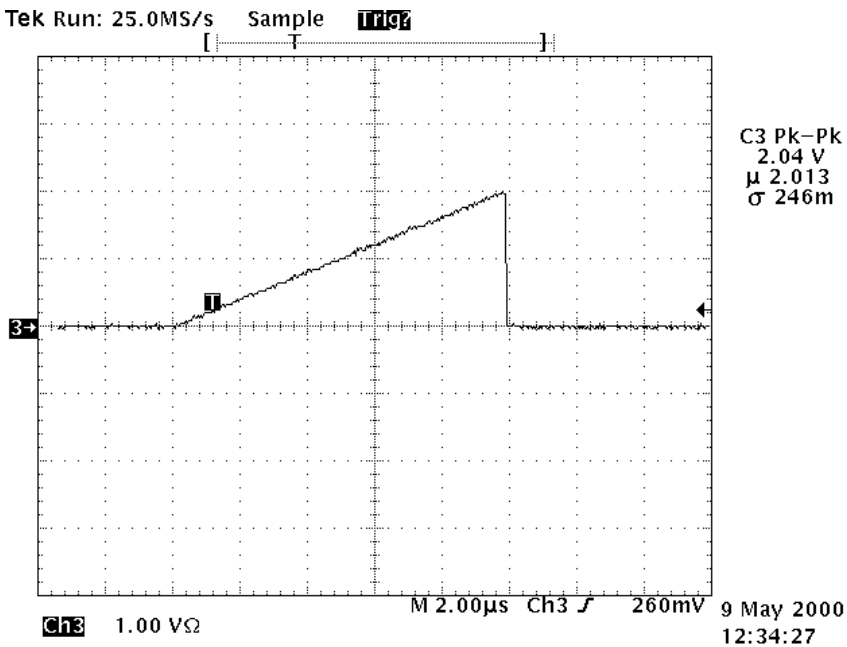
Threshold and noise characterization of board with 5 FPIX1 bare dies with two different pulse generators (I)



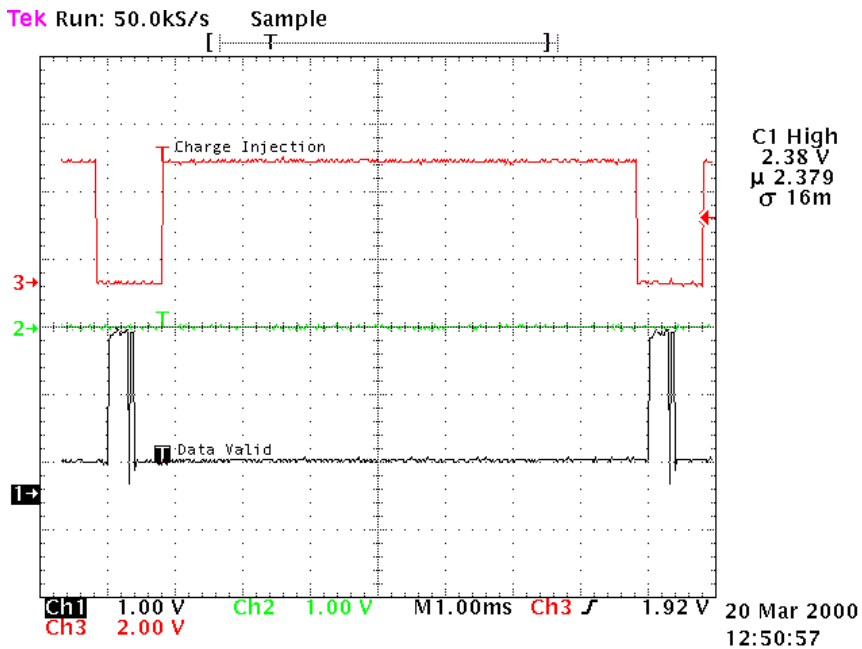


Threshold and noise characterization of board with 5 FPIX1 bare dies with two different pulse generators (II)

LeCroy 9100R



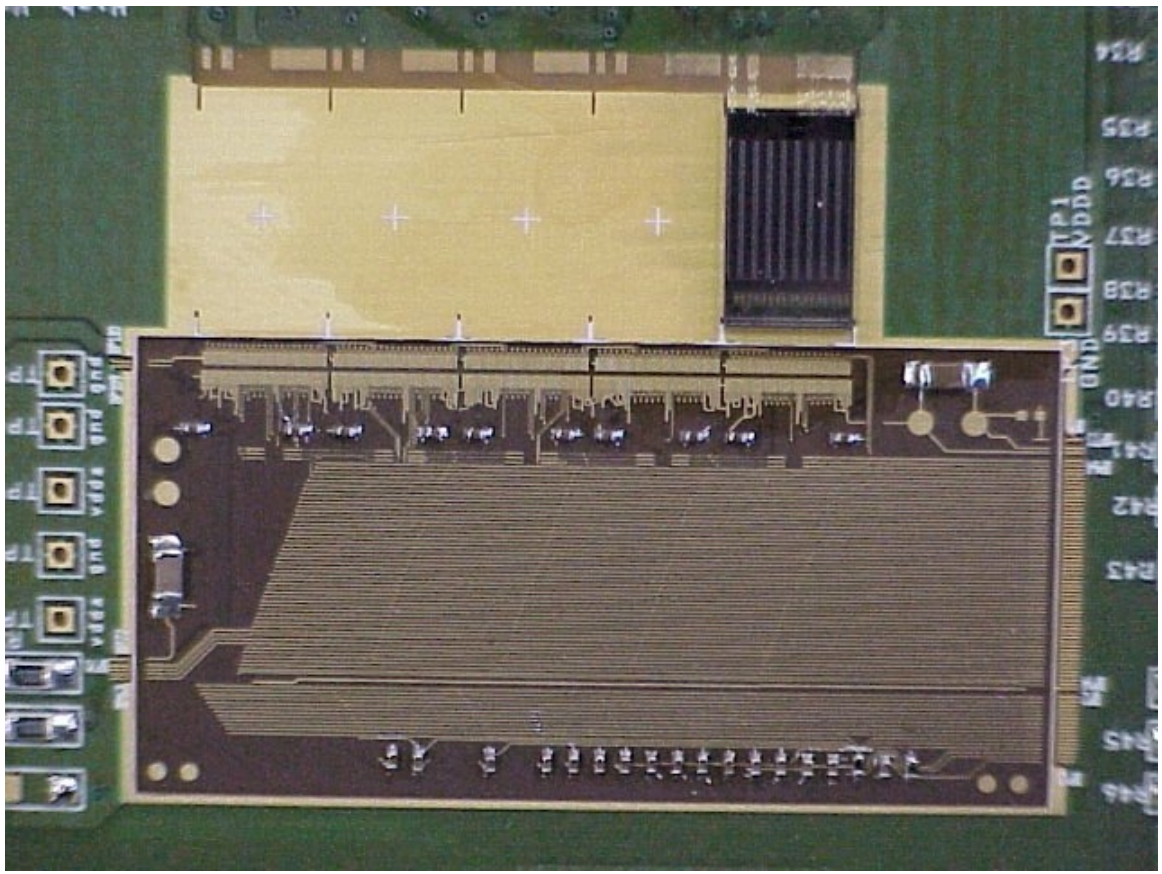
HP 8110A



Threshold and noise characterization of board with 5 FPIX1 bare dies with two different pulse generators (III)

Total number of chips	Chip ID	Threshold ($V_{th}0$)						Noise					
	HP	1.95V		2.12V		2.20V		1.95V		2.12V		2.20V	
		μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]
5	0	6504	278.83	3189.19	269.47	1672.85	257.23	41	6.13	41.77	7.97	38.84	8.76
	1	6431	216.55	3212	200.16	1755.3	185	37.7	6.5	38.56	6.78	35.83	5.38
	2	6298.87	217.61	3055.8	209.55	1611.83	189.4	43.7	7.51	43.36	7.54	38.53	7.13
	3	6524.82	240.9	3292.53	231.96	1795.94	211.83	43.8	7.5	44.53	7.72	39.38	6.83
	4	6339.5	277.67	3097.19	254	1596.64	217	43.93	6.9	43	7	42.88	8.56
	LeCroy	1.95V		2.12V		2.20V		1.95V		2.12V		2.20V	
		μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]	μ [e-]	σ [e-]
5	0	6234.69	449.9	3110.41	282.73	1349.39	299.22	45.23	15.27	43.42	11.14	48.08	10.48
	1	6476.65	305.28	3302.87	216.93	1597.56	217.63	39.85	12.77	38.69	9.83	41.66	8.78
	2	6372.8	269.58	3167.21	243.38	1470.89	228.55	42.74	14.22	41.76	10.54	45.13	9.4
	3	6486.05	254.19	3276.42	227.65	1558.21	225.35	42.91	13.23	41.88	10.69	45.73	9.92
	4	6294.48	259.28	3095.95	248.39	1385.36	259.06	44.48	14.13	45.59	11.68	49.15	10.51

Threshold and noise characterization of board with 1 FPIX1 bare die

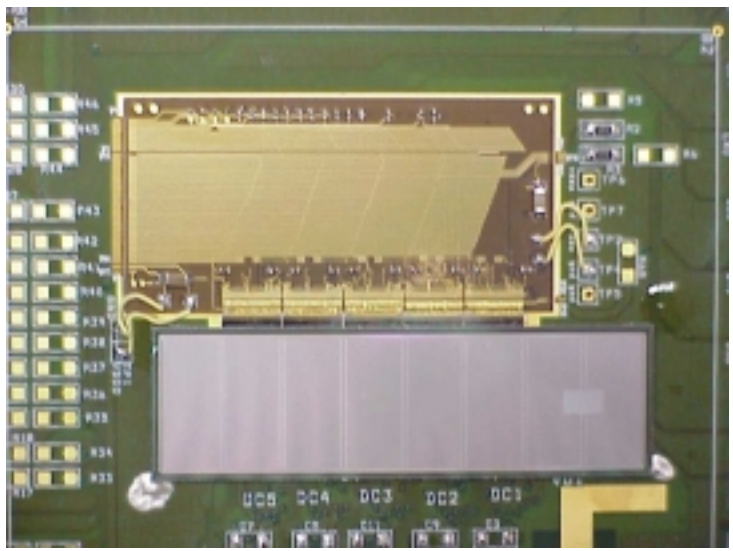


Threshold and noise characterization of board with 1 FPIX1 bare die

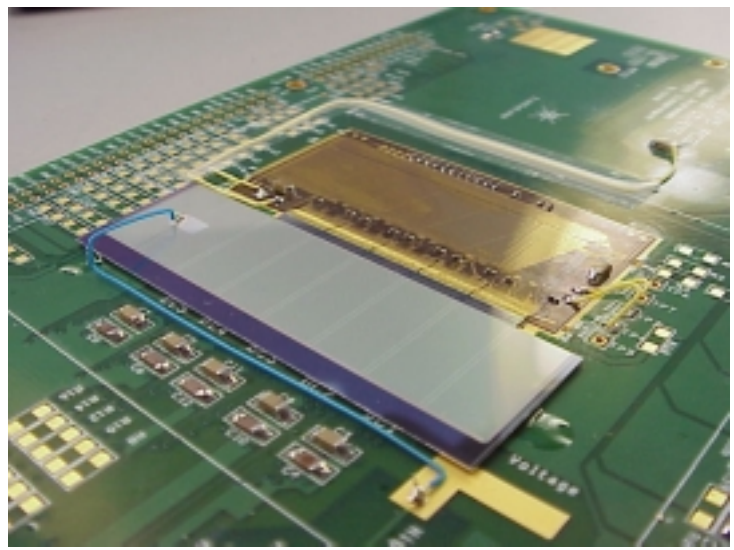
Total number of chips	Chip ID	Threshold ($V_{th}0$)						Noise					
1	LeCroy	1.95V		2.12V		2.25V		1.95V		2.12V		2.25V	
		μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]
	0	8483.04	303.41	4833.2	302.84	2357.45	323.82	61.01	10.6	56.27	12.04	57.89	11.84

Radioactive Source (Sr 90) hit map of ATLAS sensors

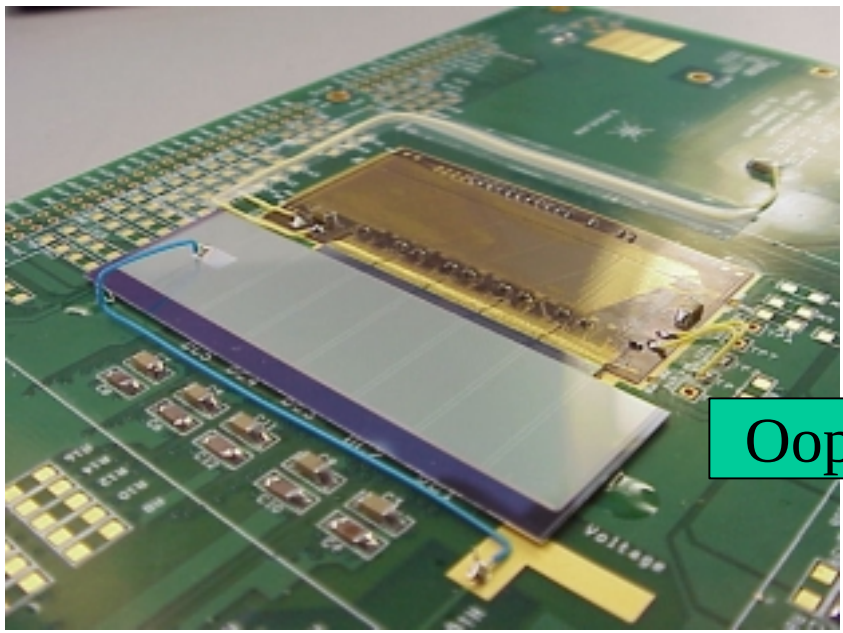
ATLAS SEIKO PSTOP



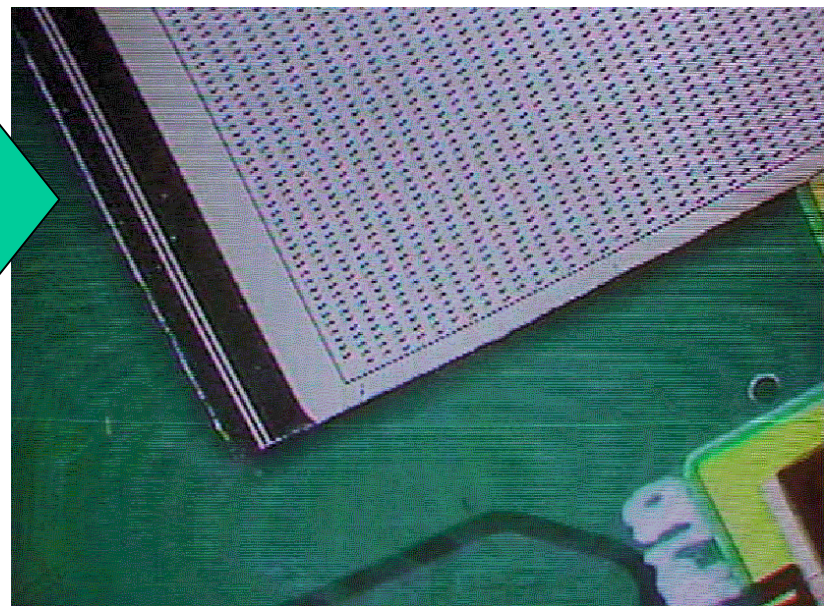
ATLAS SEIKO PSPRAY



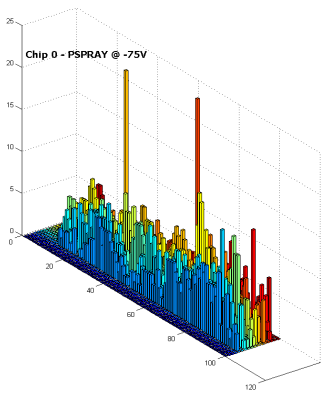
Radioactive Source hit map with ATLAS sensors PSRAY

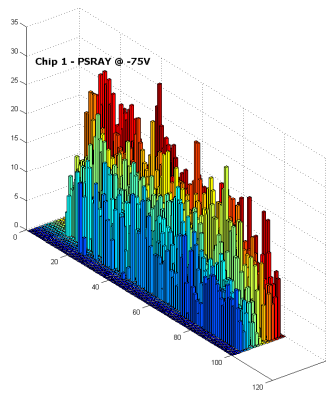


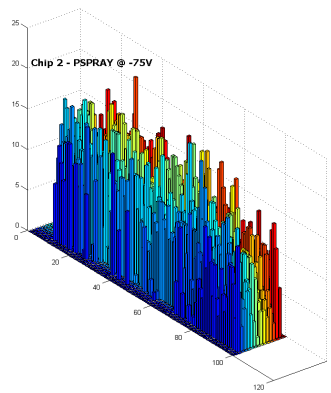
Oops!

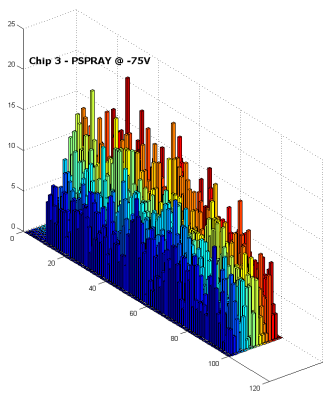


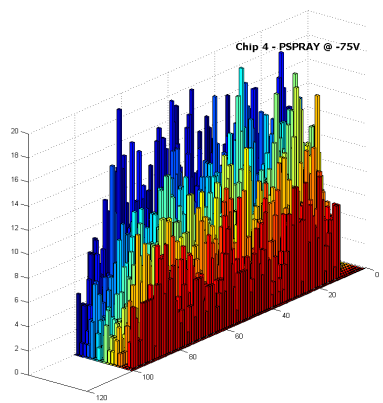
Radioactive Source hit map with ATLAS sensors
PSRAY









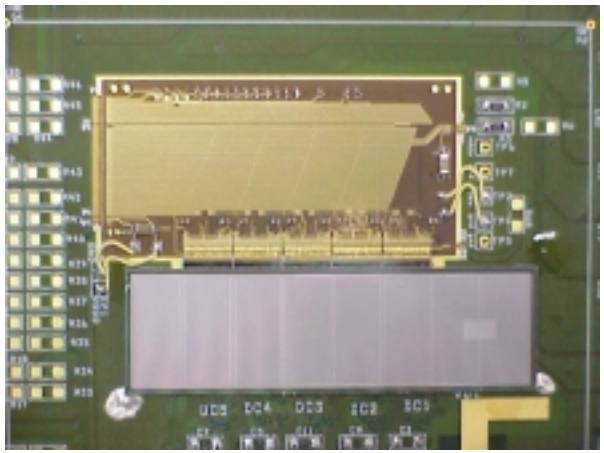


Threshold and noise characterization of board with 5 FPIX1 bare dies bump bonded to ATLAS sensors

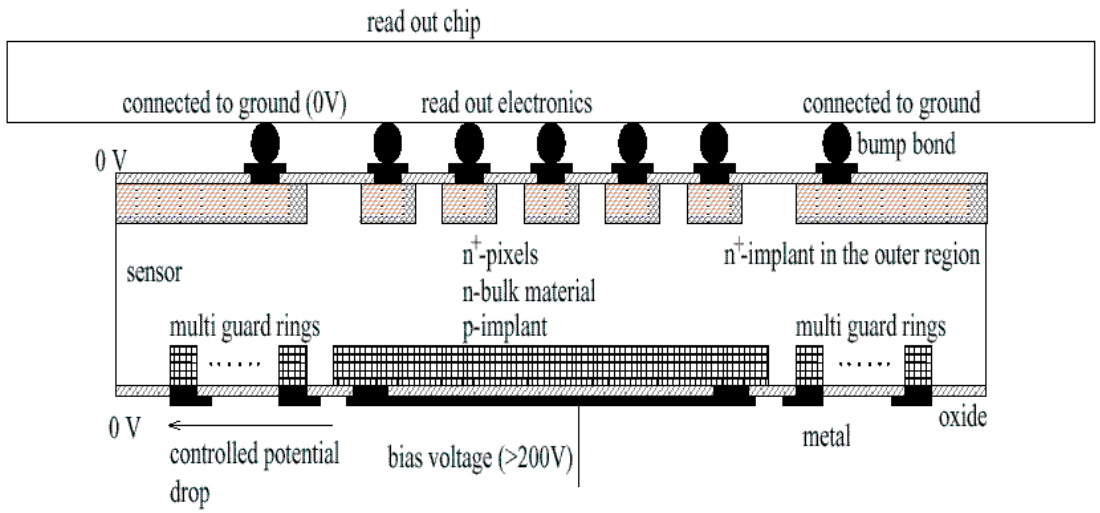
ATLAS PSPRAY bump bonded to 5 FPIX1, 5 working

Total number of chips	Chip ID	Threshold ($V_{th}0$)				Noise			
		2.12V		2.20V		2.12V		2.20V	
		μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]
5	0	2913.39	383.68	1027	399.25	73.72	28.35	73.33	26
	1	3180.24	312.75	1250.8	345.14	68.23	26.55	68	25.19
	2	3399.96	385.87	1562	365.47	69.14	23.98	68.7	19.3
	3	3316.65	426.49	1414.83	427.79	77.92	25.8	78.3	23.87
	4	2741.38	593.42	1286.66	707.66	106.34	43.63	82.87	25.65

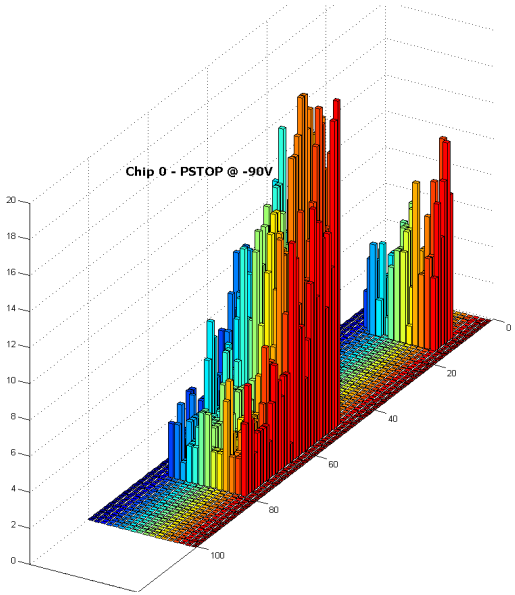
Radioactive Source hit map with ATLAS sensors PSTOP

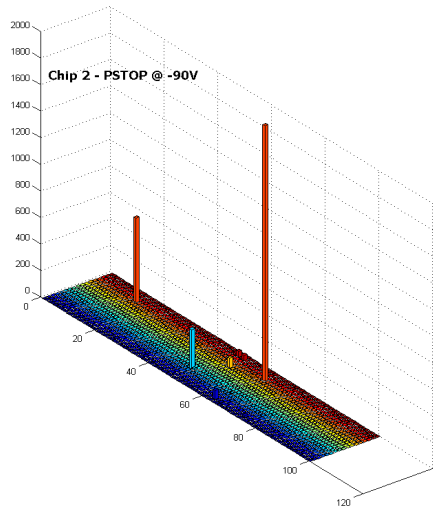


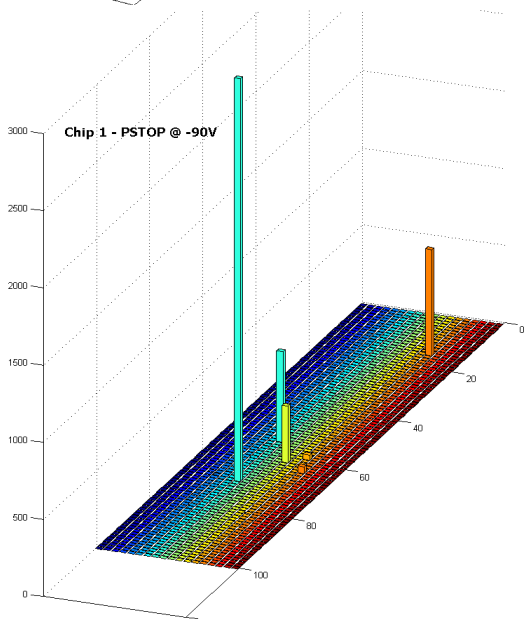
Oops!

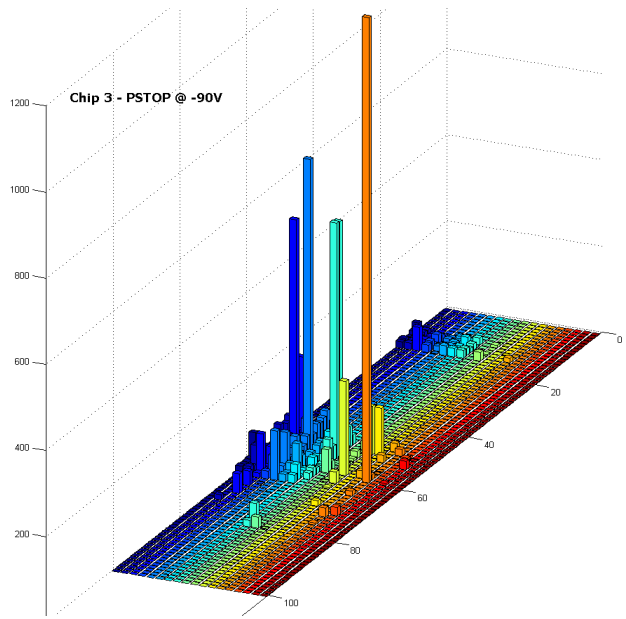


Radioactive Source hit map with ATLAS sensors PSTOP







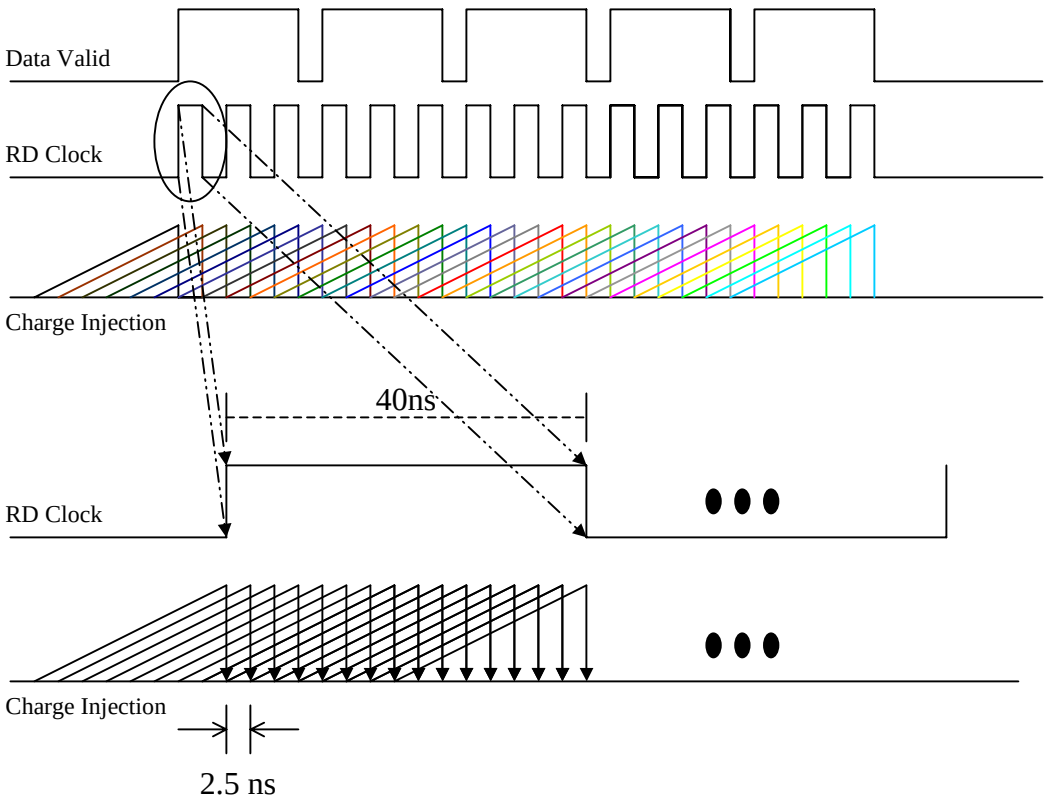


Threshold and noise characterization of board with 5 FPIX1 bare dies bump bonded to ATLAS sensors

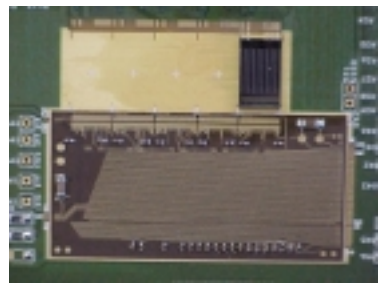
ATLAS PSTOP bump bonded to 5 FPIX1, 4 working

Total number of chips	Chip ID	Threshold ($V_{th}0$)						Noise					
	LeCroy	1.95V		2.12V		2.20V		1.95V		2.12V		2.20V	
		μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]	μ [e⁻]	σ [e⁻]
4	0	6212.43	349.37	3080.72	276.24	1649.49	254.24	69.78	14.23	68.12	16.84	62.47	16.3
	1	5842.2	391.65	2846.75	294.76	1406.4	307.62	59.65	13.74	56.77	9.83	53.5	12.52
	2	6101.5	271.12	3035.29	236.01	1589.17	222.18	56.66	11.98	52.12	9.11	49.45	11.12
	3	7277.5	323.35	4358.95	253	2865.48	250.01	59.87	14.97	62.18	11.84	61.87	11.5

Characterization of threshold with injection of charge in different points of readout

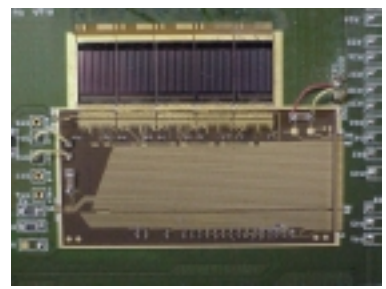


Boards tested:



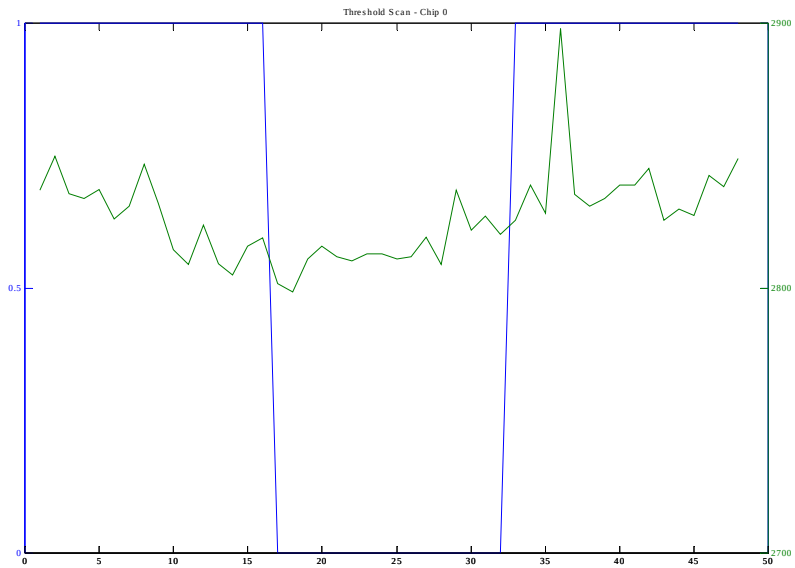
1 bare die

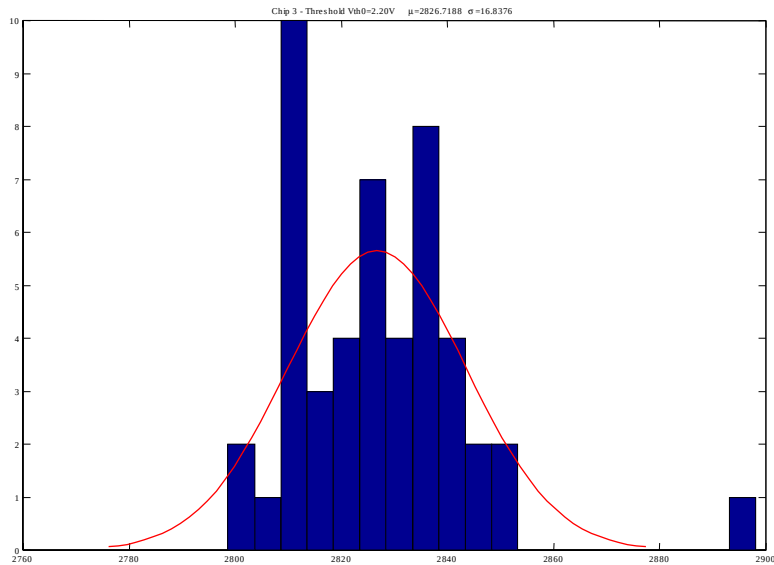
5 bare dies

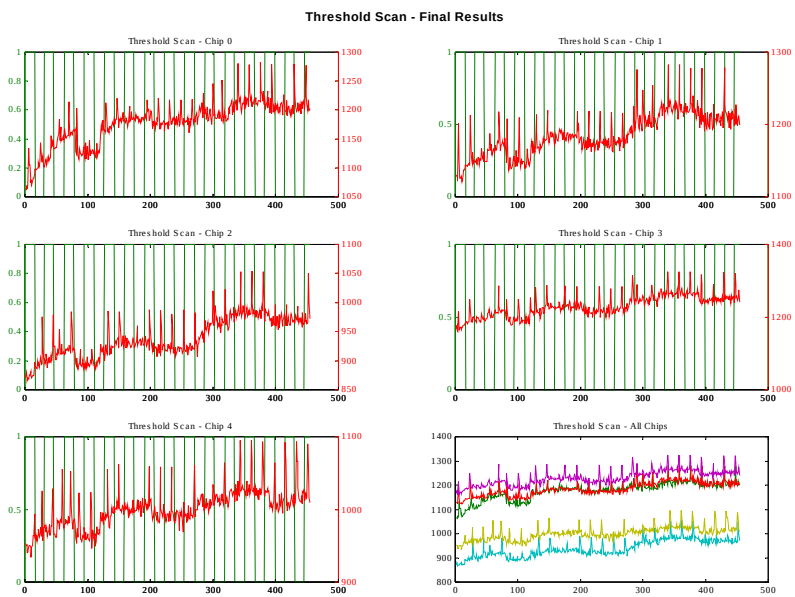
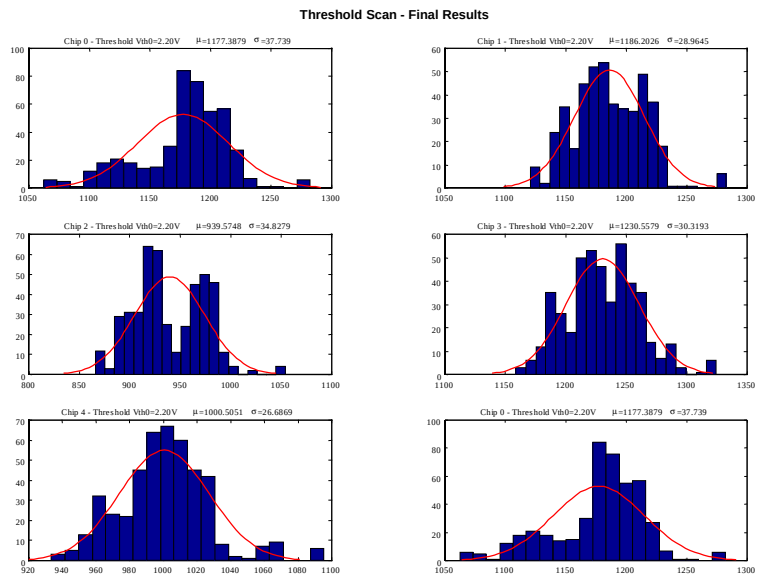


Characterization of threshold with injection of charge in different points of readout

1 bare die





Characterization of threshold with injection of charge in different points of readout

5 bare dies