



BERKELEY LAB

LAWRENCE BERKELEY NATIONAL LABORATORY



U.S. DEPARTMENT OF
ENERGY

Strip Module test: **HOMER**

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IHEP & LBNL

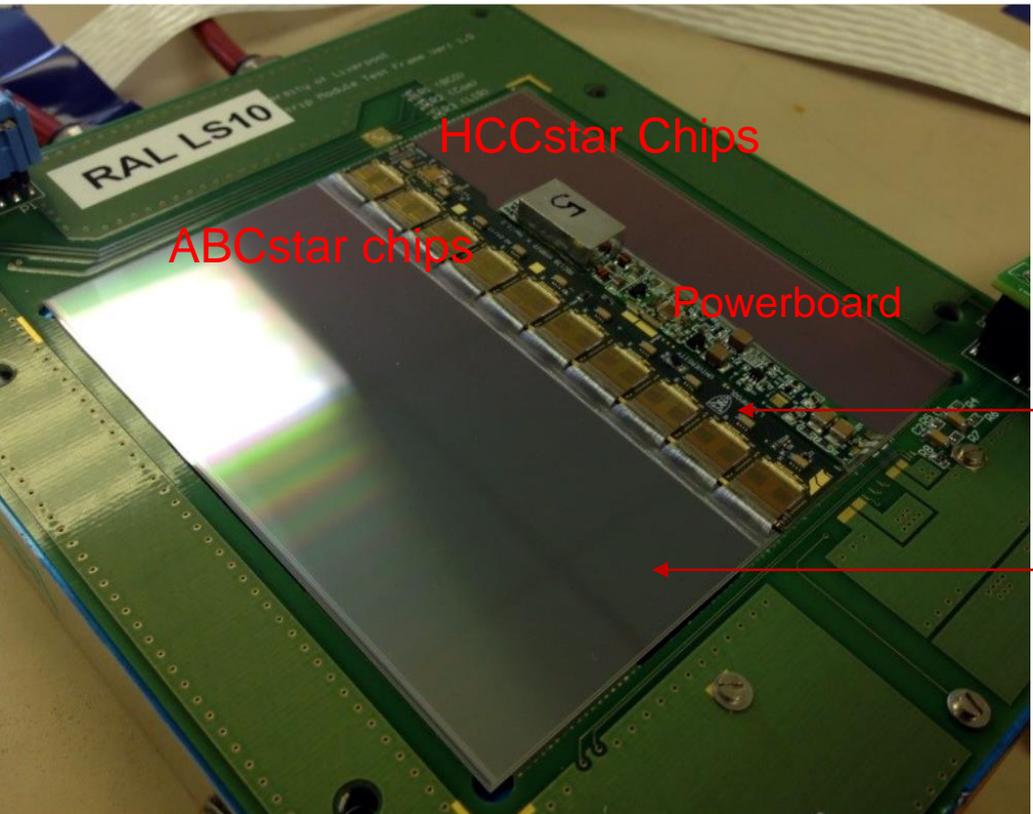
04/10/20



LBL-LS-011-HOMER

The strip module we built recently.

- Components Series Number
 - Sensor: W124;
 - Hybrid: GPC1938-X_021A_H5
 - PB: 201 0012
- Building Timeline
 - Hybrid building: 2/27
 - Glue Hybrid: 3/2
 - Glue Powerboard: 3/3
 - Bonding: 3/5
 - Finish testing: 3/12



Hybrid

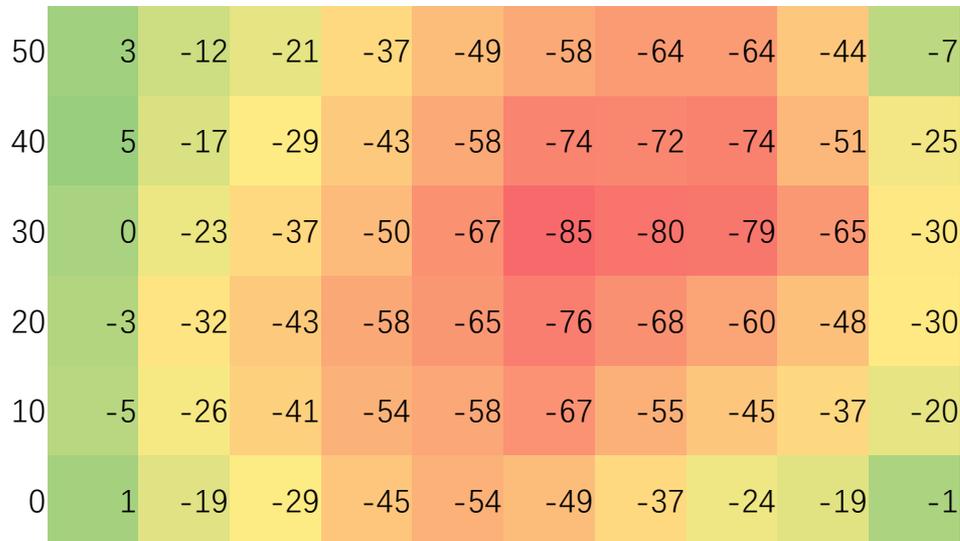
Sensor

Typical strip barrel module (Long Strip), from our [ABC paper](#)

Module metrology layout



Hybrid

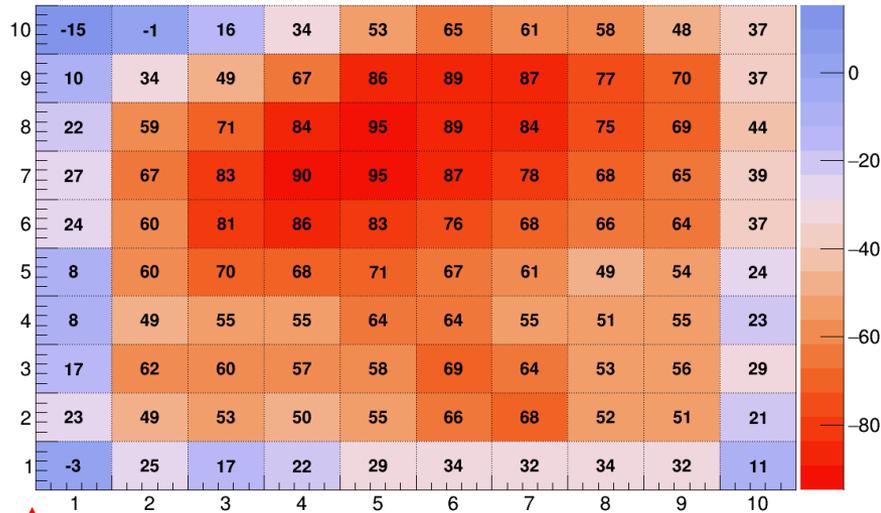


We could use the smartscope to measure the layout of the each region of the strip module.

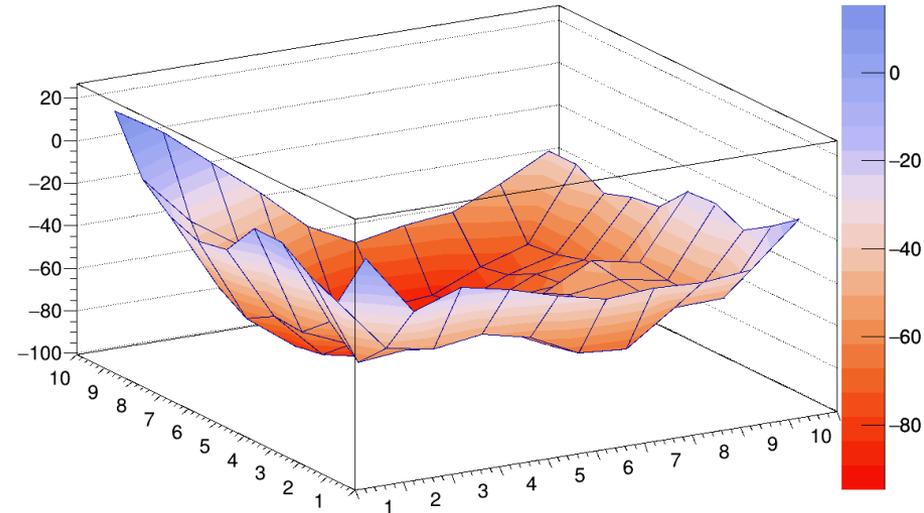
In this routine, with the bottom left corner as the standard point, we looped over the 100 regions to know the relative height.

W124 Sensor Bowl

2020_w124_vac



2020_w124_vac



Choose the bottom left edge as the datum origin.
(So different with the previous mail.)

Though the bending is acceptable, it's worthy to mention that the problematic bonding Phat met is exactly at the lowest region (-97).

DAQ Test Environment:

Itsdaq-sw: Latest

Firmware: Latest, nexysv_itsdaq_vb43a_FIB_STAR.bit

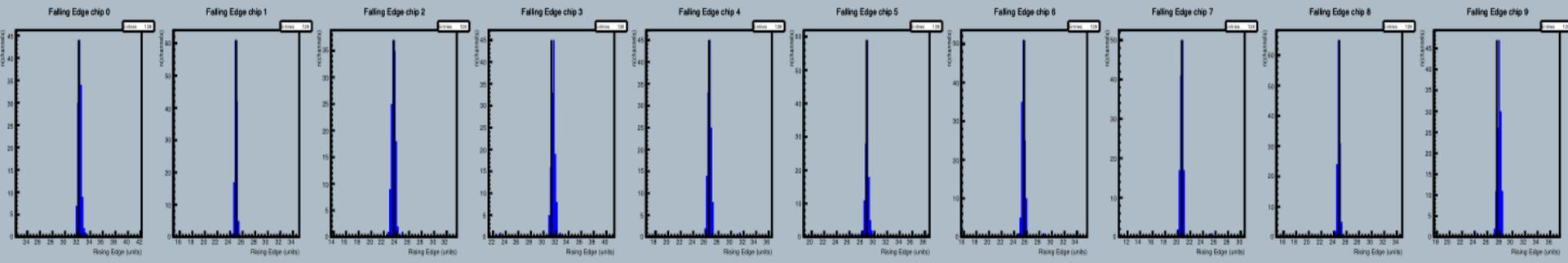
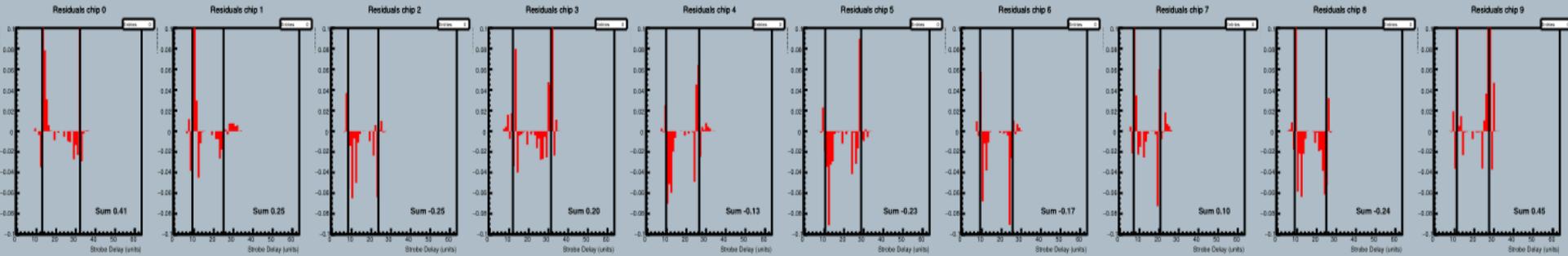
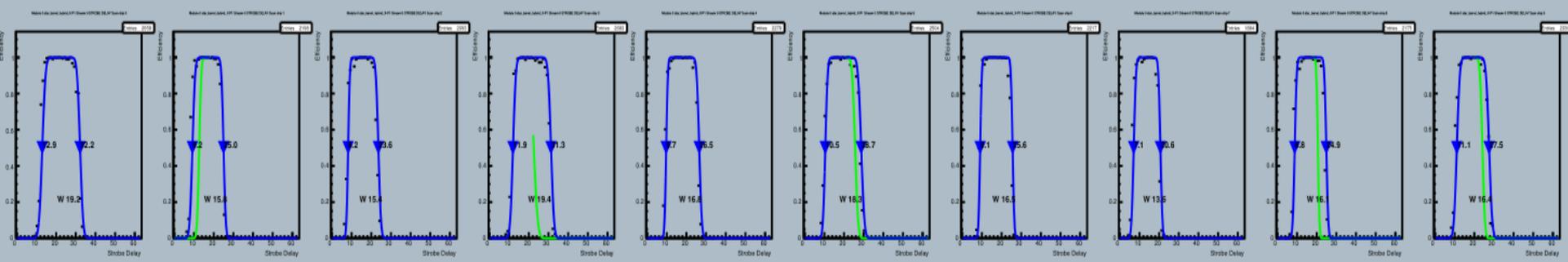
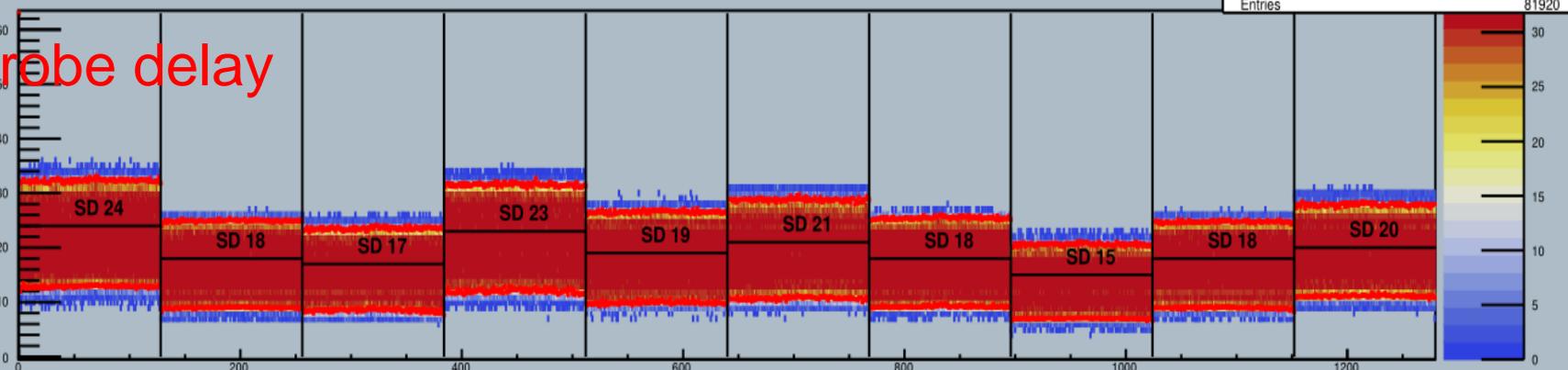
Relative Humidity: 12%

Temperature: Chiller: 17°C ; Arduino readout: 20.3°C

Considering the new box to get better RH, T and light shielding;

Current: LV: 11V~0.307A, HV: -350V~ -35.8 μ A

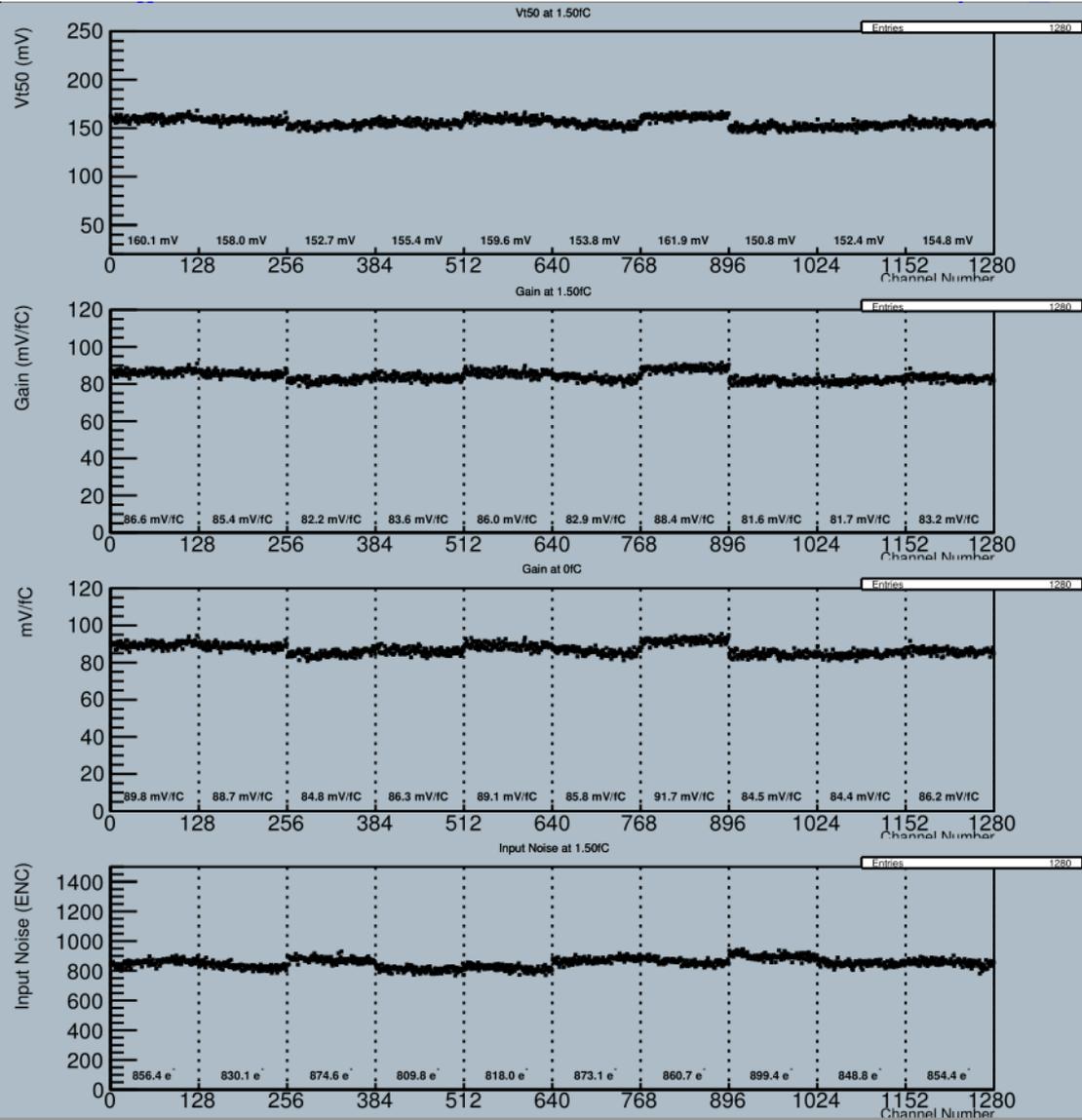
Strobe delay



Response vs Channel



Vt50

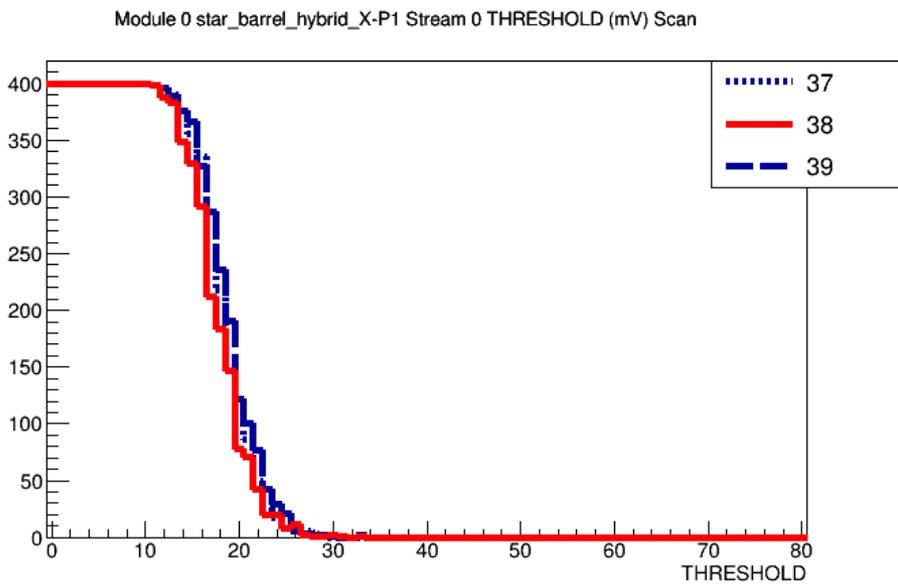


Input noise ~800.
Agree with the
previous results.

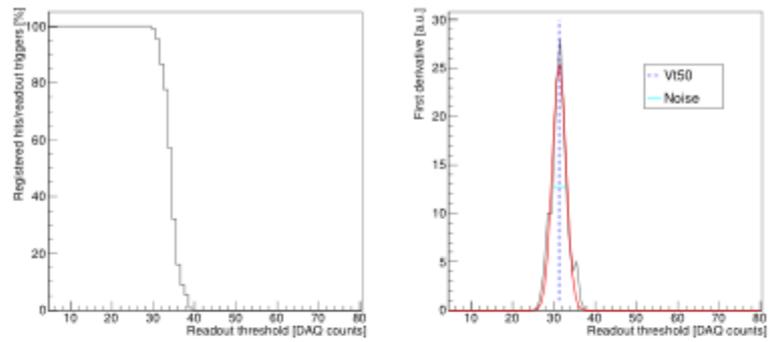


S-Curve

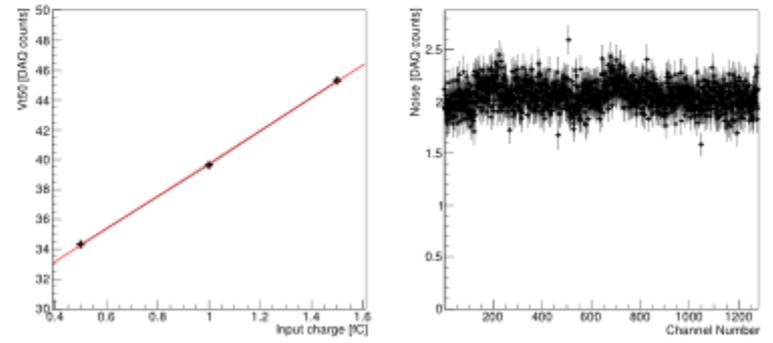
Threshold



From our paper

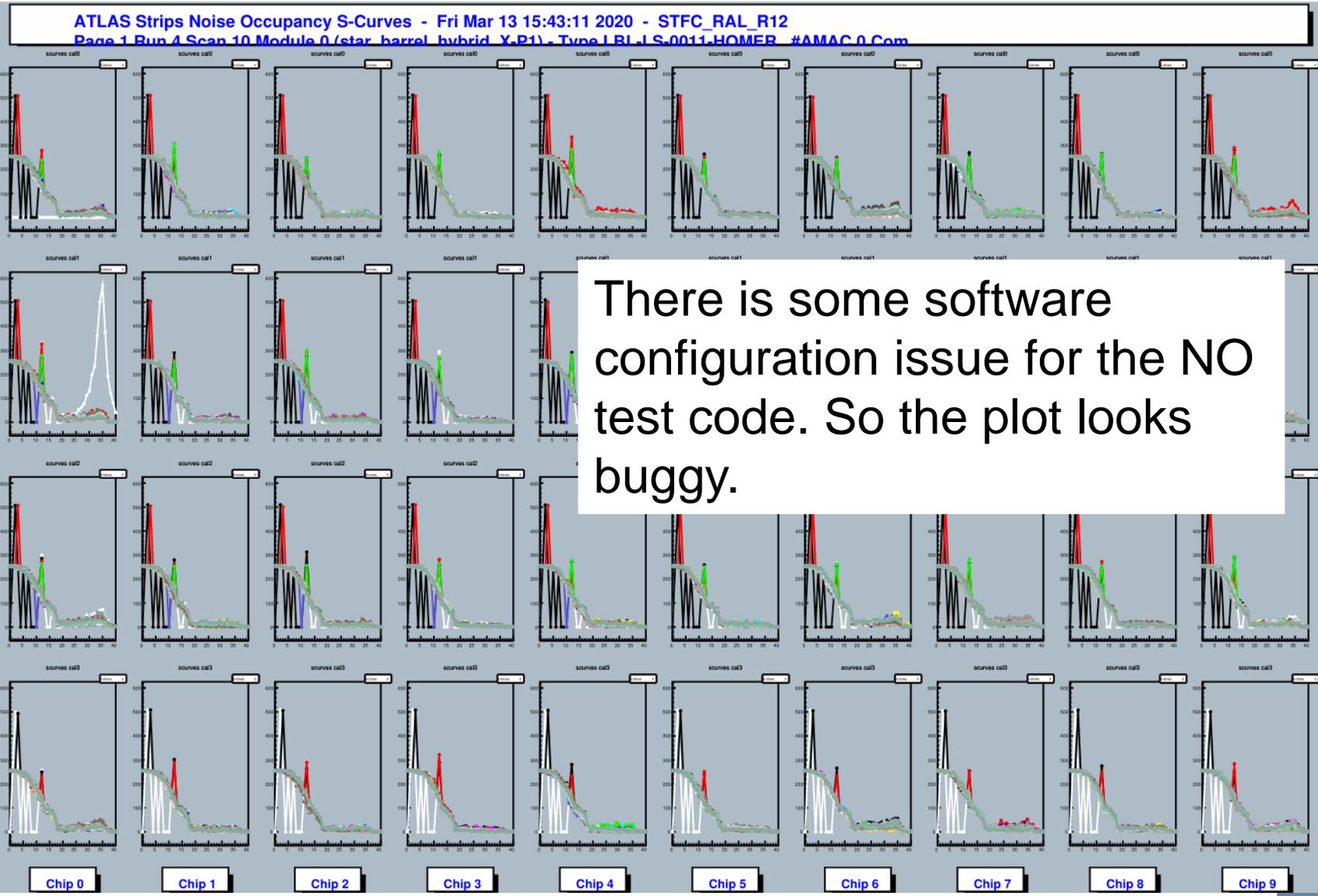


(a) S-curve obtained from a threshold scan of a readout channel (b) First derivative of an S-curve with scan of a readout channel



(c) Gain of individual readout channel, (d) Noise of channels from all ASICs on one hybrid (about 400 ENC)

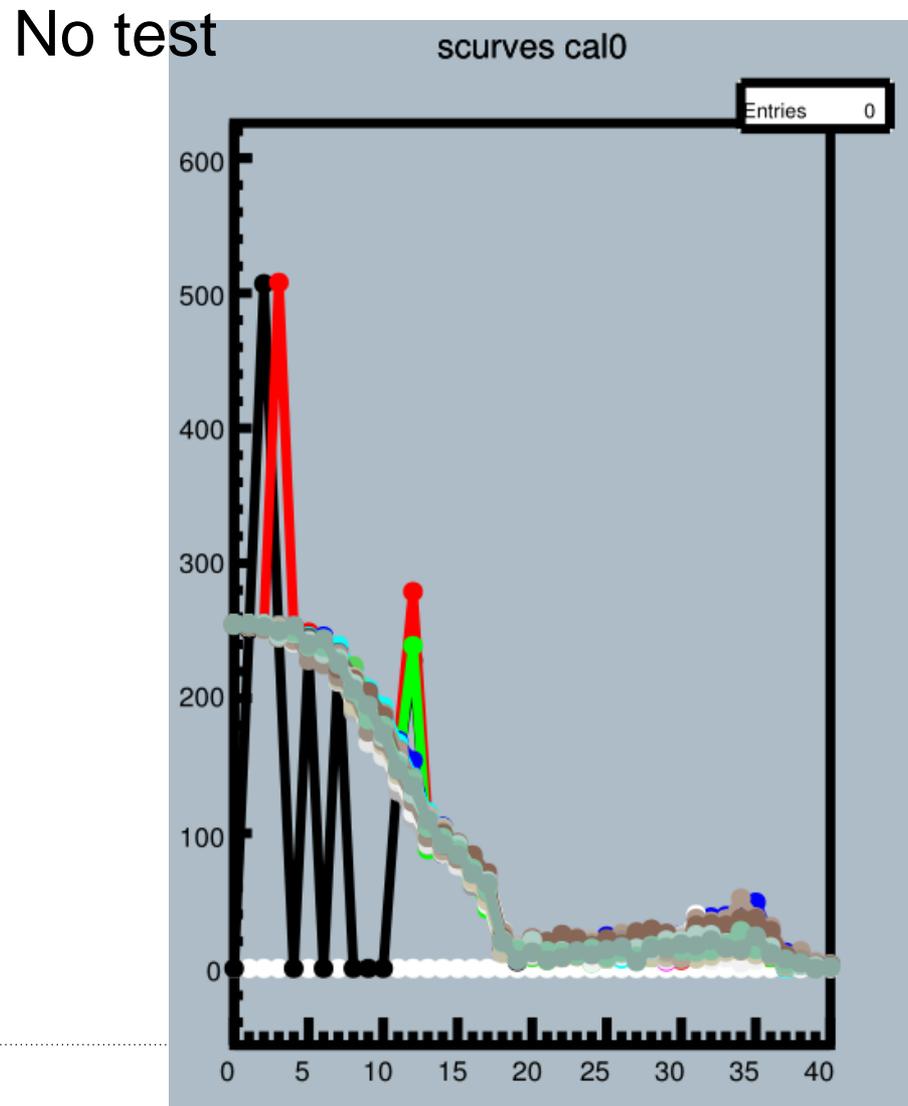
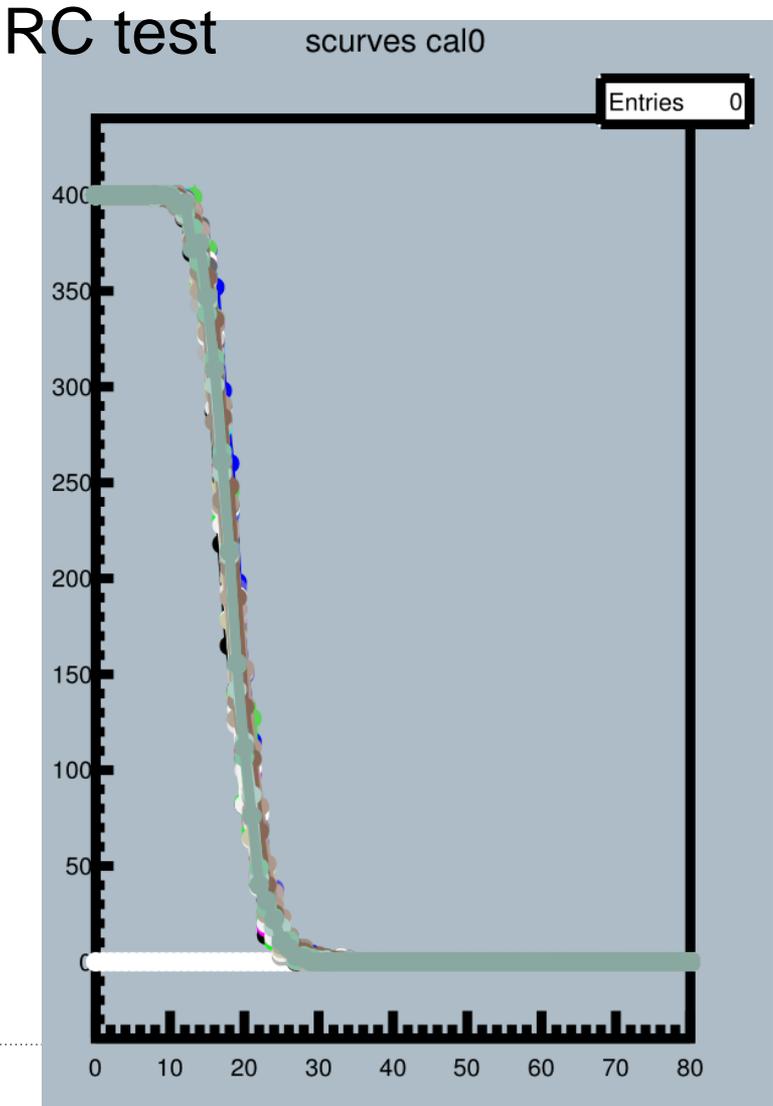
Noise Occupancy S-Curve



S-Curve from Response curve test



Comparison



Our module is in a good state. NO test issue is now under discussing with the expert and it should be fixed soon.