



中国科学院高能物理研究所
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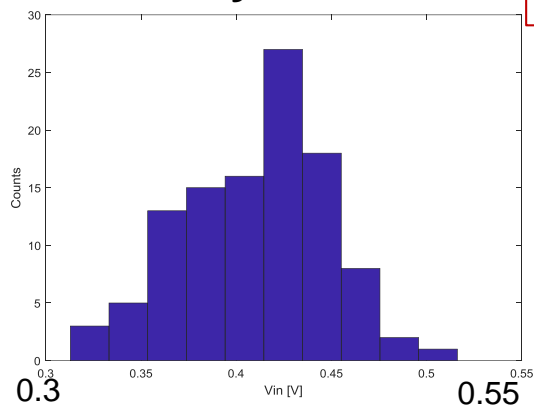
TaichuPix-2 test results

Ying ZHANG

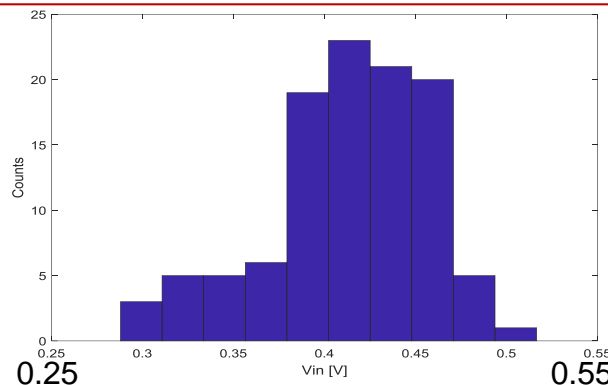
Pixel analog threshold – S1

- S-curve scanning for one double column, with one pixel enable every time

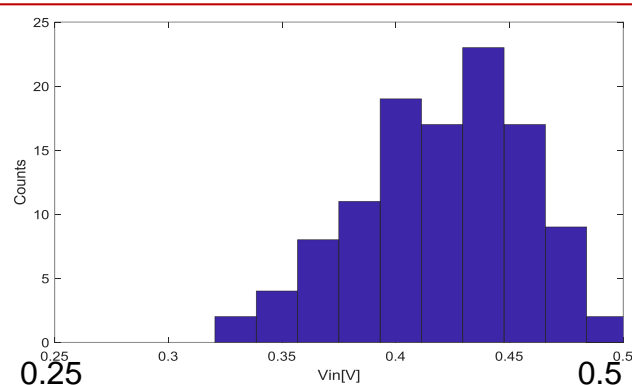
Average threshold ~ 0.4 V, std dev ~ 0.033 V for each column



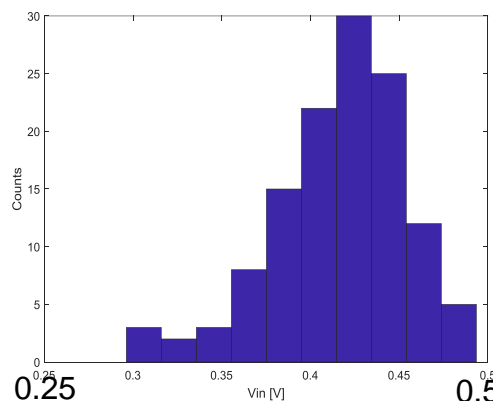
Col<1>, row<20-127>



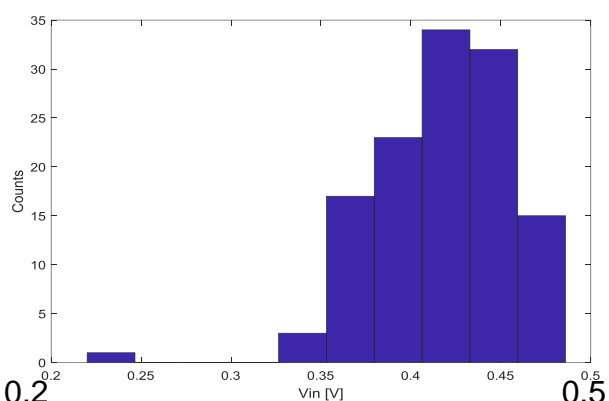
Col<2>, row<20-127>



Col<6>, row<16-127>



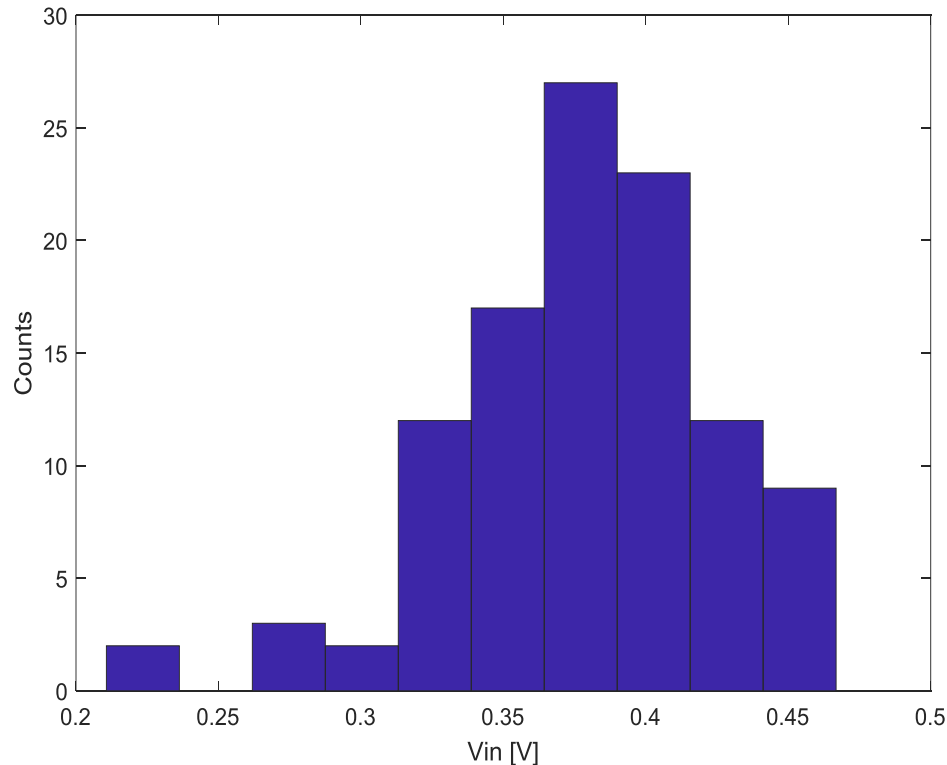
Col<12>, row<3-127>



Col<16>, row<3-127>

Pixel analog threshold – S2

- Same bias condition with S1, S2 has different layout with S1; no VCASP in S2



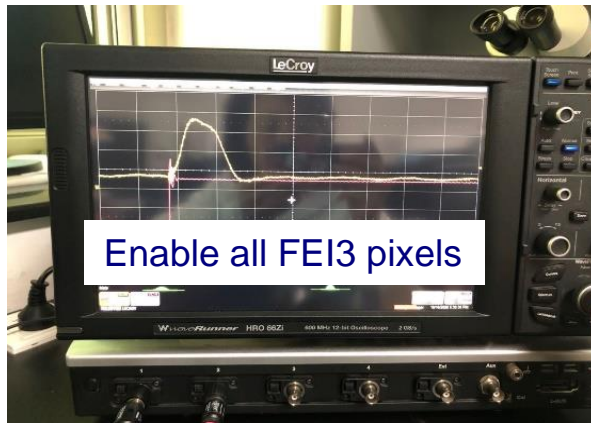
Col<18>, row<21-127>

- Threshold and dispersion seem similar to S1, more test needed

Problem of analog crosstalk/overlap

- Crosstalk/overlap was detected when multiple pixels was calibration enabled (enable 'APULSE' for analog test)

- The more pixels enabled, the higher amplitude of analog output



OUTA0 vs. different number of pixels enabled

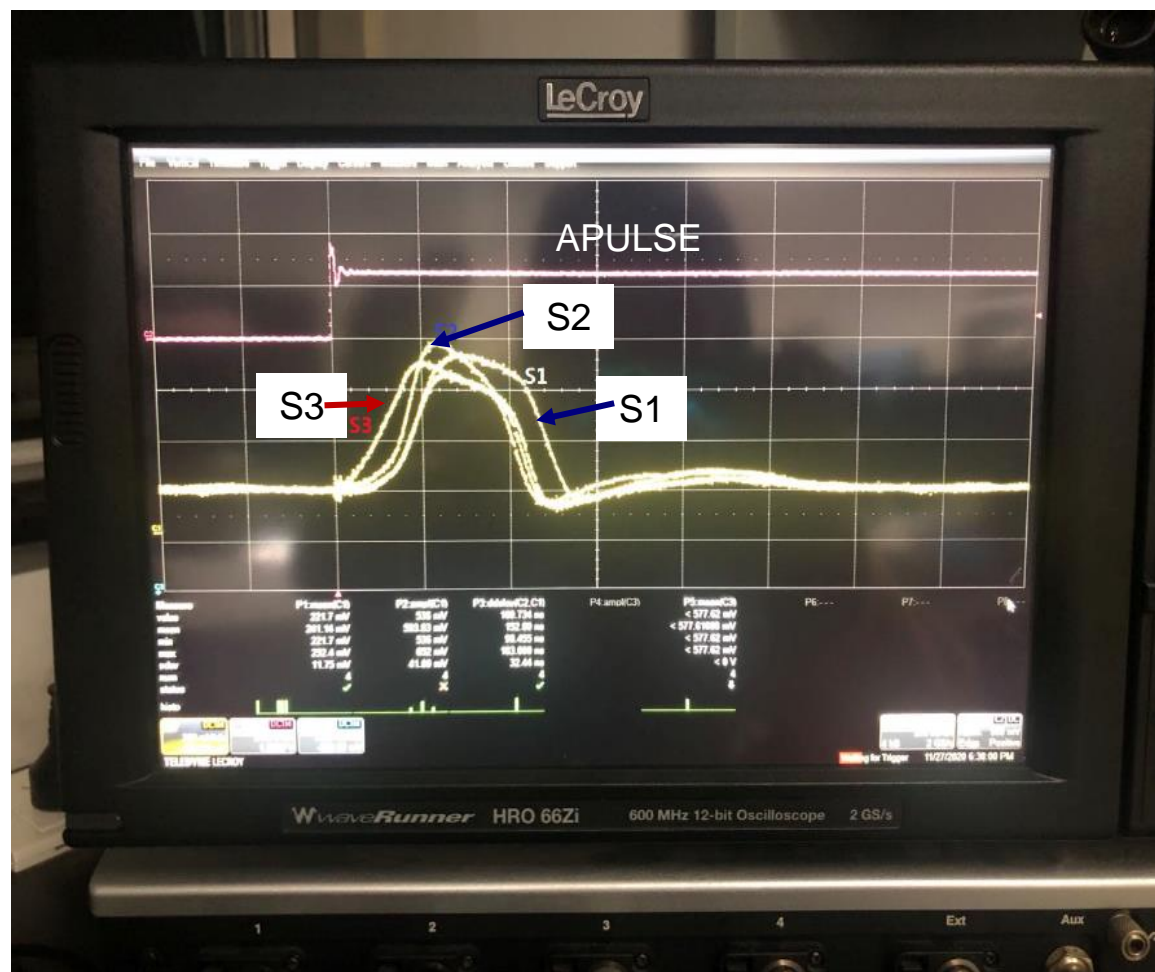
- When multiple columns are cal-enabled, the analog output in disabled column also have response to 'APULSE', which is abnormal

- **Effect of IDB on the crosstalk problem**

- Decreasing IDB will reduce the amplitude of analog, and reduce the crosstalk to the disable pixels

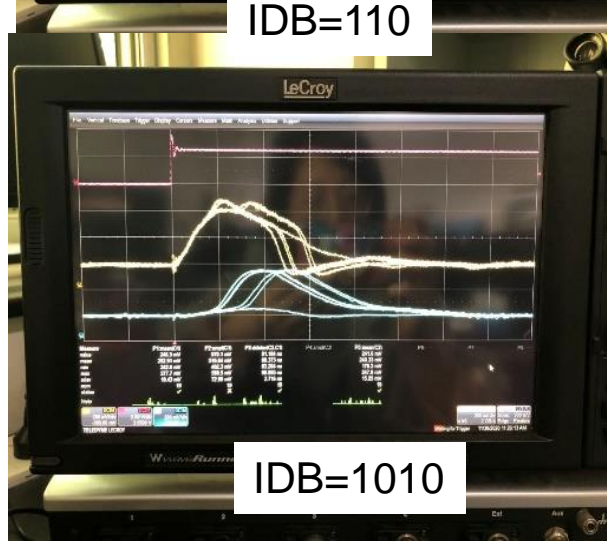
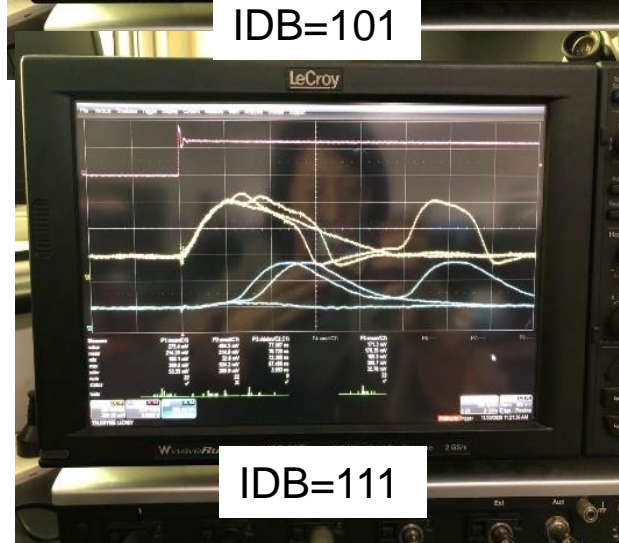
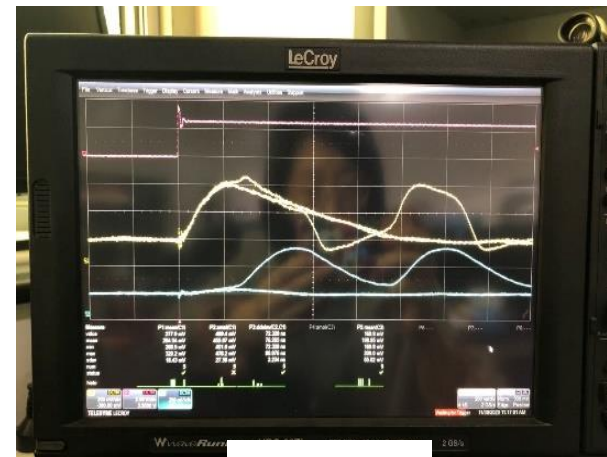
Effect of IDB (1)

- IDB=11000 (nominal value, used in previous tests)
 - When S3 cal-enabled, all analog probe outputs have response



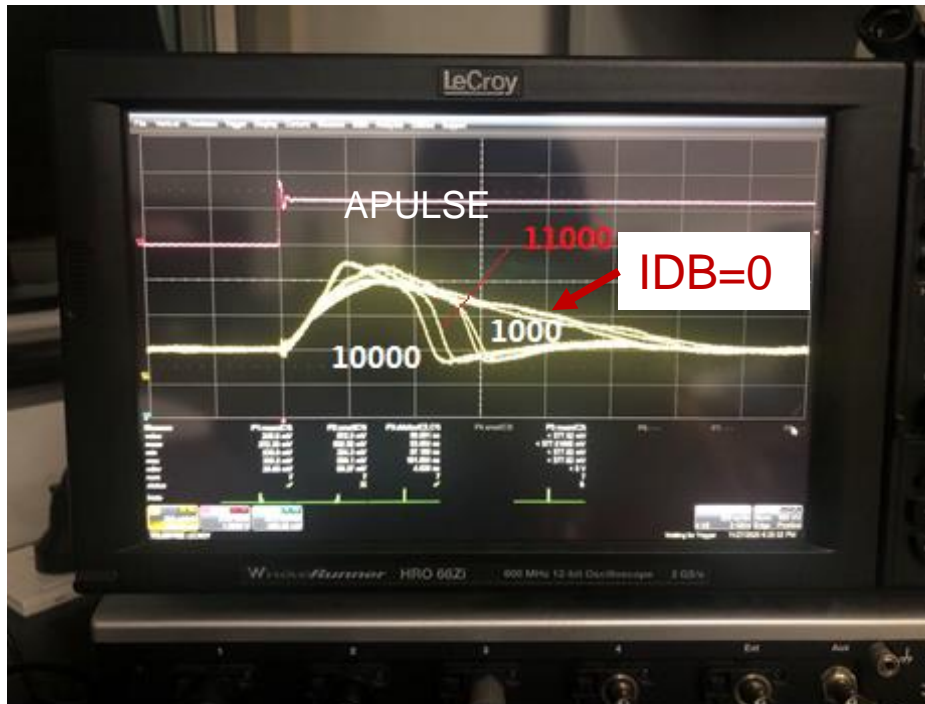
Effect of IDB (2)

- Crosstalk problem with different IDB, when **IDB=101** no crosstalk observed



Effect of IDB (3)

- $V_{in} = 0.9\text{ V}$, response of S3 with different of IDB
- The amplitude of analog output decreases with IDB decreasing, and the duration of analog signal increased

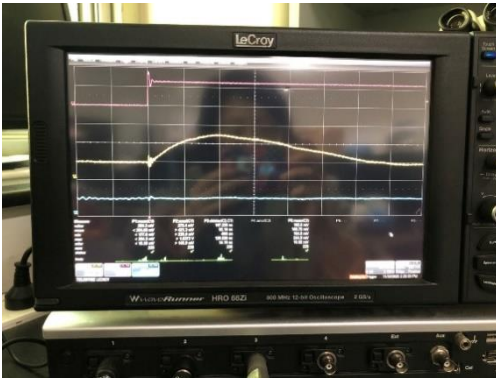


IDB=0/10/100/1000/1100/10000/11000

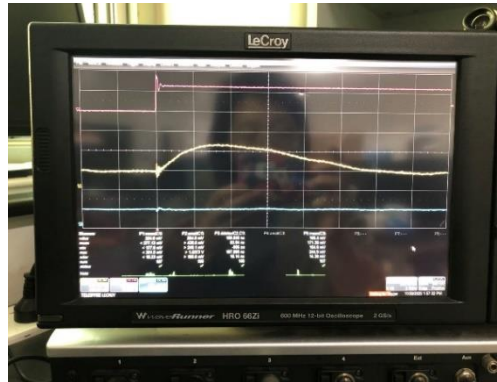
Effect of IDB (4)

- When IDB = 101, the responses of pixel <41, 128> are almost same in the cases of one pixel/one column/one sector cal-enabled

$V_{in} = 0.5 \text{ V}$



one pixel enabled



one column enabled



one sector enabled

- The reason of IDB effect need more investigation
 - No crosstalk observed in the previous X-ray tube verification
- It's better to use a low IDB in the measurements to avoiding the effect

Issue of mask

■ Mask=1 for S1, S2, S4-S6

- 'Dpulse' should be valid for S1, S2, S4
- When input a 'dpulse', the readout result different from time to time

