中国科学院高能物理研究所
Institute of High Energy Physics
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TaichuPix-2 test results

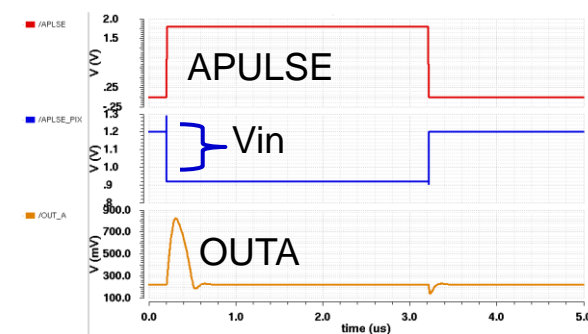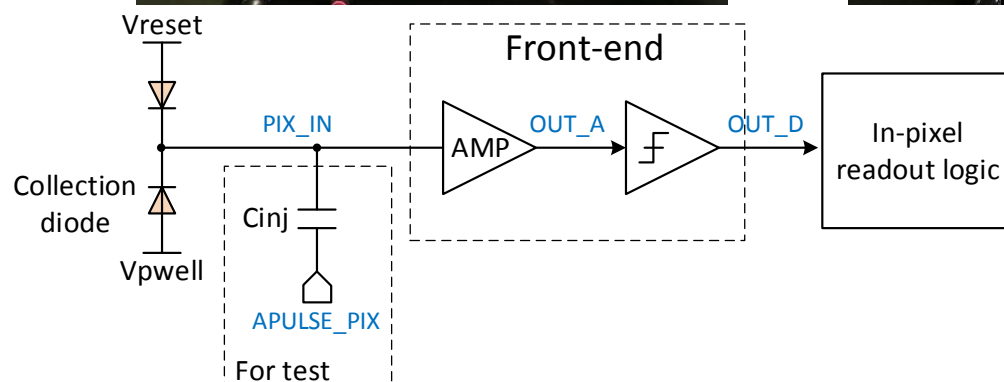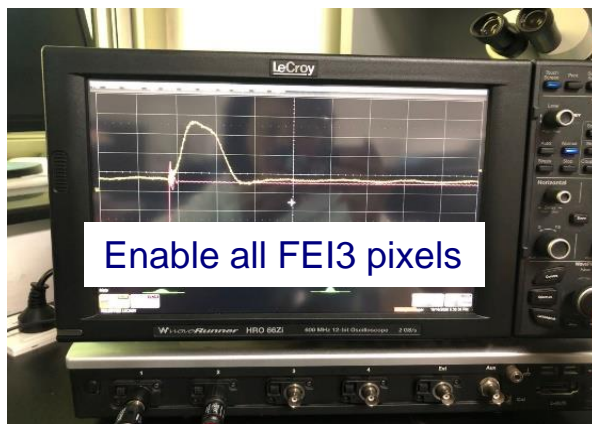Ying ZHANG

Pixel analog output

- **General test setup**
  - VDD=1.8 V (AVDD=DVDD), VHIGH/VLOW provided by DAC on test board

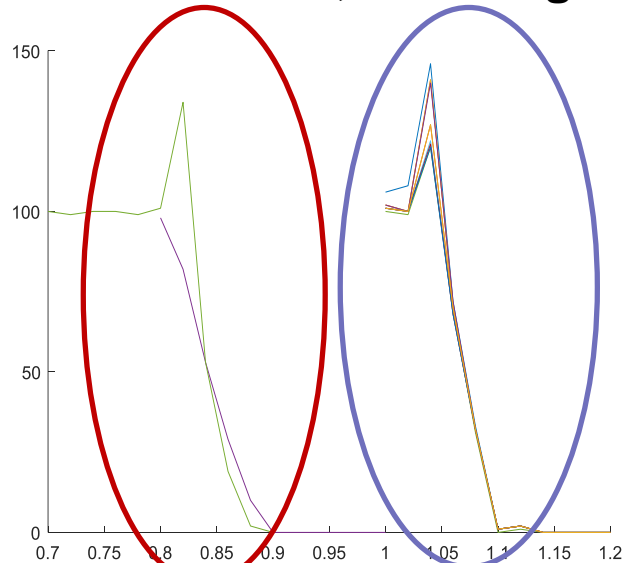- **Number of enabled pixels affect the amplitude and duration of analog output**
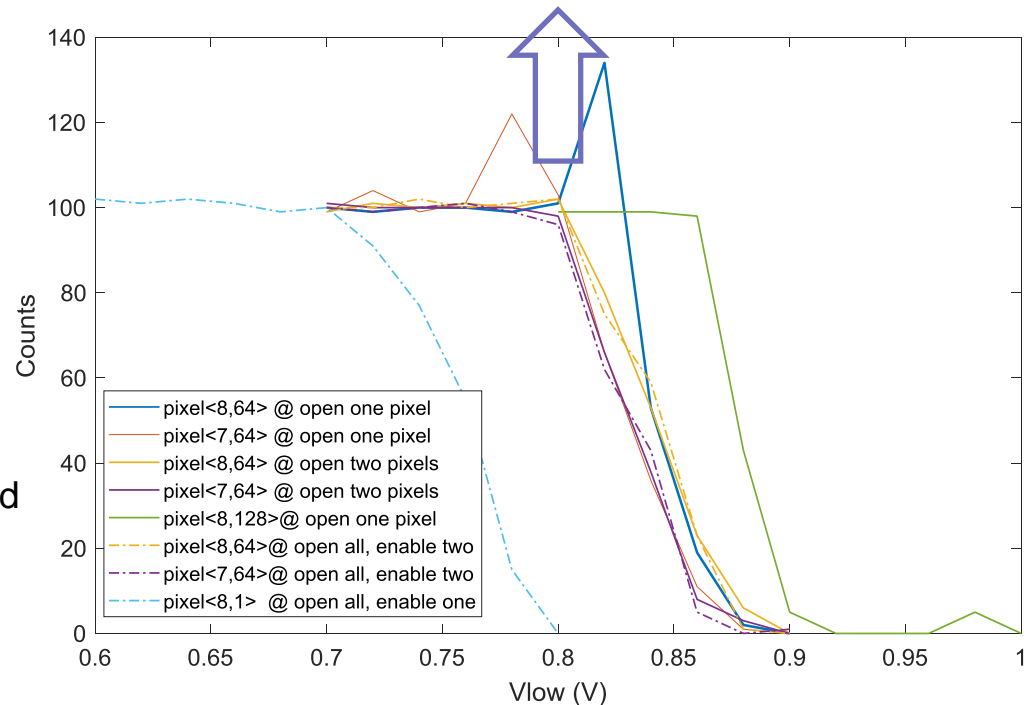
OUTA0 vs. different number of pixels enabled

Enable all FEI3 pixels

Enable one pixel

S-curve

- **VHIGH=1.2 V, scanning with different VLOW**

'mask' does not affect s-curve, but pulse_en does

1/2 pixels unmasked & 128 pixels
enabled   Unmask & enabled

Legend:
- pixel<8,64> @ open one pixel
- pixel<7,64> @ open one pixel
- pixel<8,64> @ open two pixels
- pixel<7,64> @ open two pixels
- pixel<8,128>@ open one pixel
- pixel<8,64>@ open all, enable two
- pixel<7,64>@ open all, enable two
- pixel<8,1> @ open all, enable one

- **In the following test, all FEI3 pixels are unmasked**

S-curve
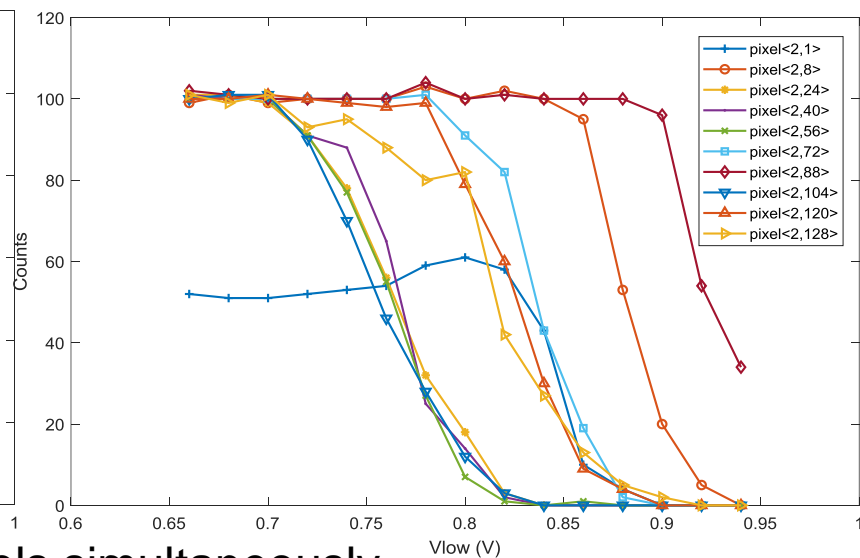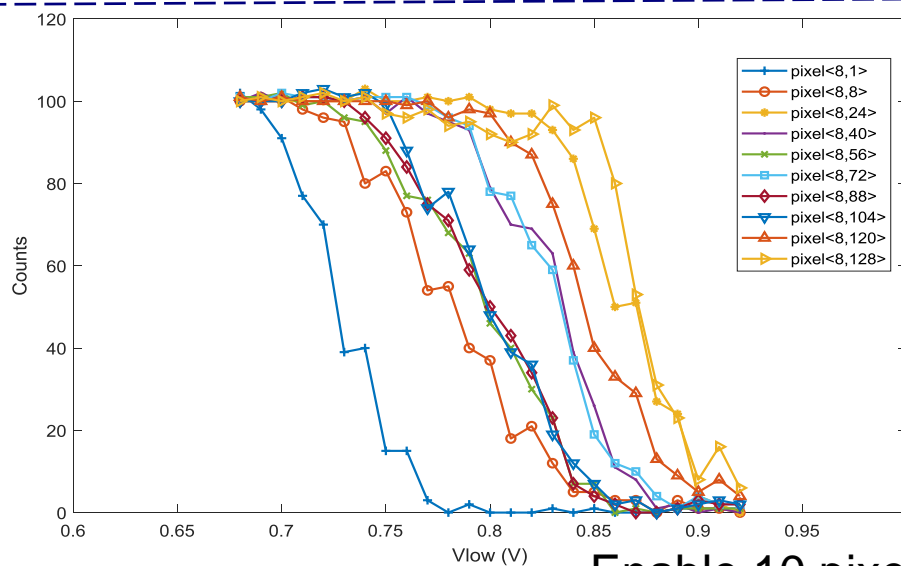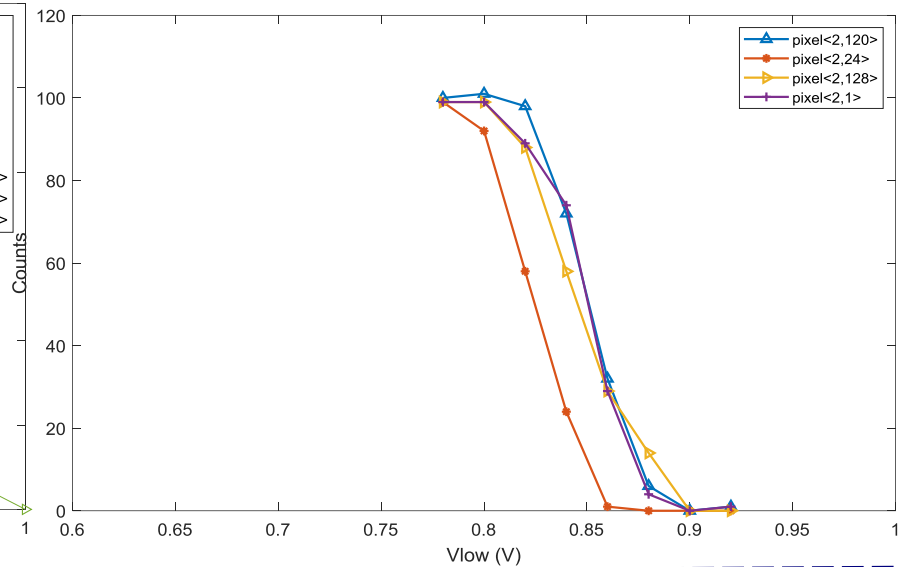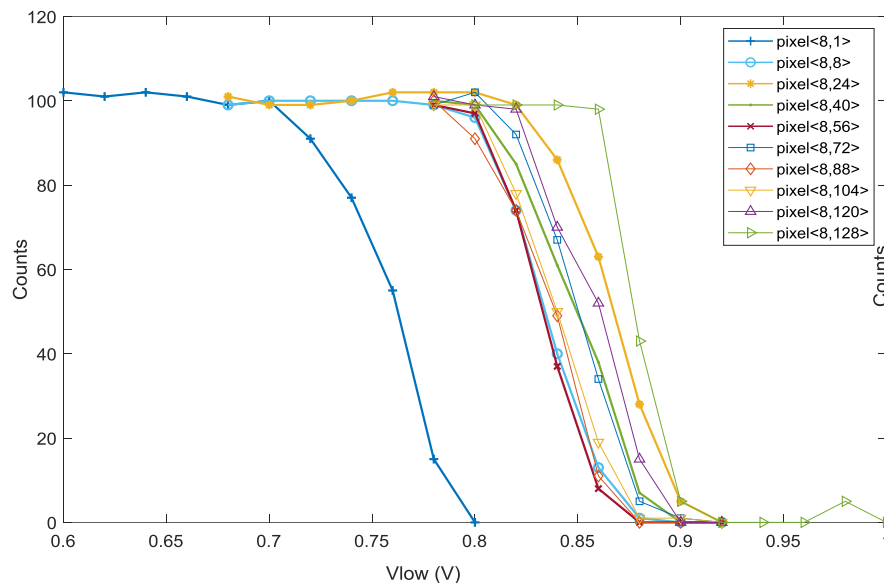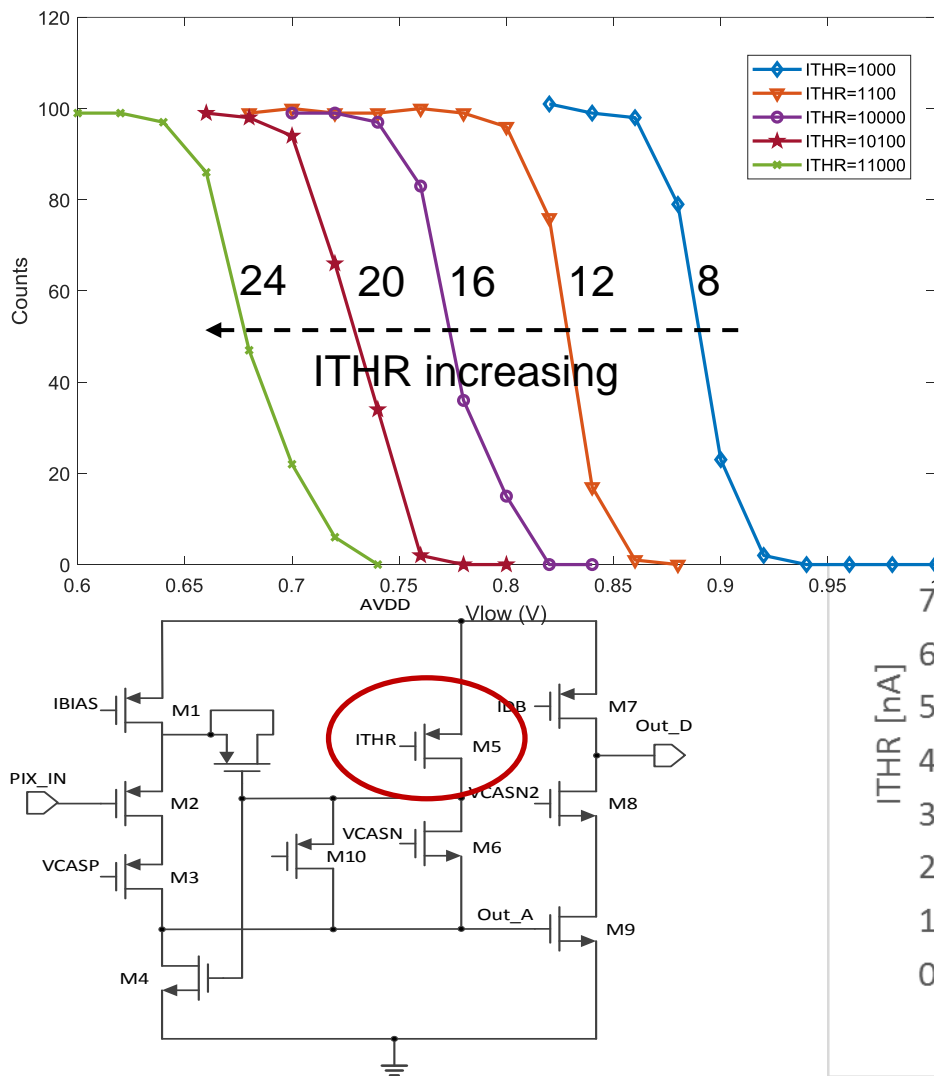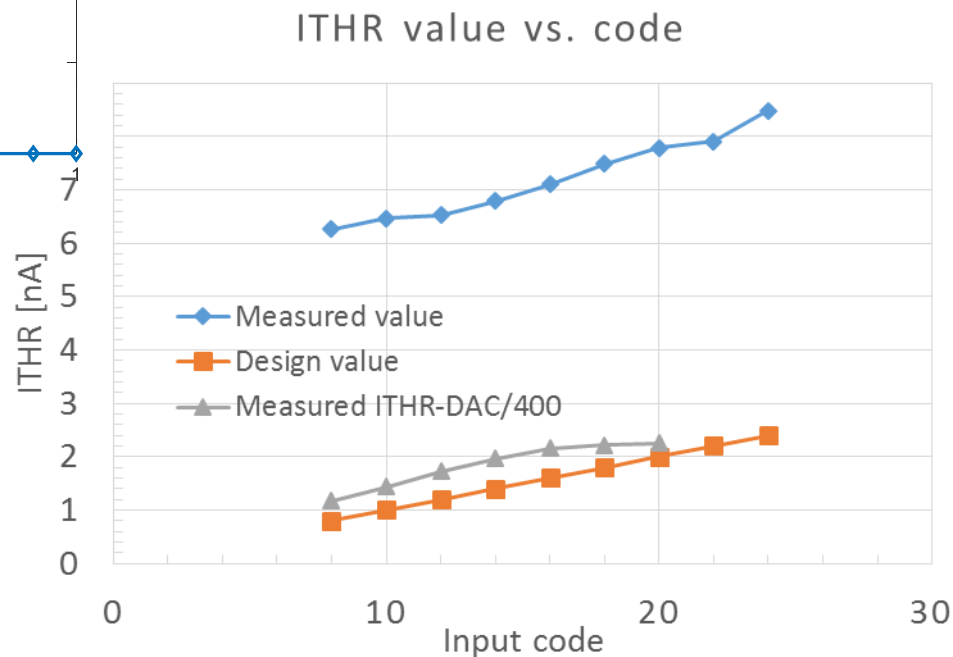
Enable 10 pixels simultaneously

Effect of ITHR

- **Threshold increases with ITHR, coincides with design**

Measured ITHR disagree with designed value

Summary and plan

- **With one pixel enabled, the amplitude and duration of analog output disagree with design**
  - Effect of crosstalk/resonance
  - BIAS condition different with design?
  - Fine adjustment of bias V&I has done, no bias set found same analog output with design
  - Measured min. noise ~13 mV, min. threshold ~300 mV
- **S-curve measurement need to be done with one pixel enable every time**
  - Rough max. threshold dispersion ~200 mV (pk-to-pk), measured with one column

- **Next step:**
  - S-curve for each sector, evaluate different FE design
  - Find the reason of crosstalk/resonance problem