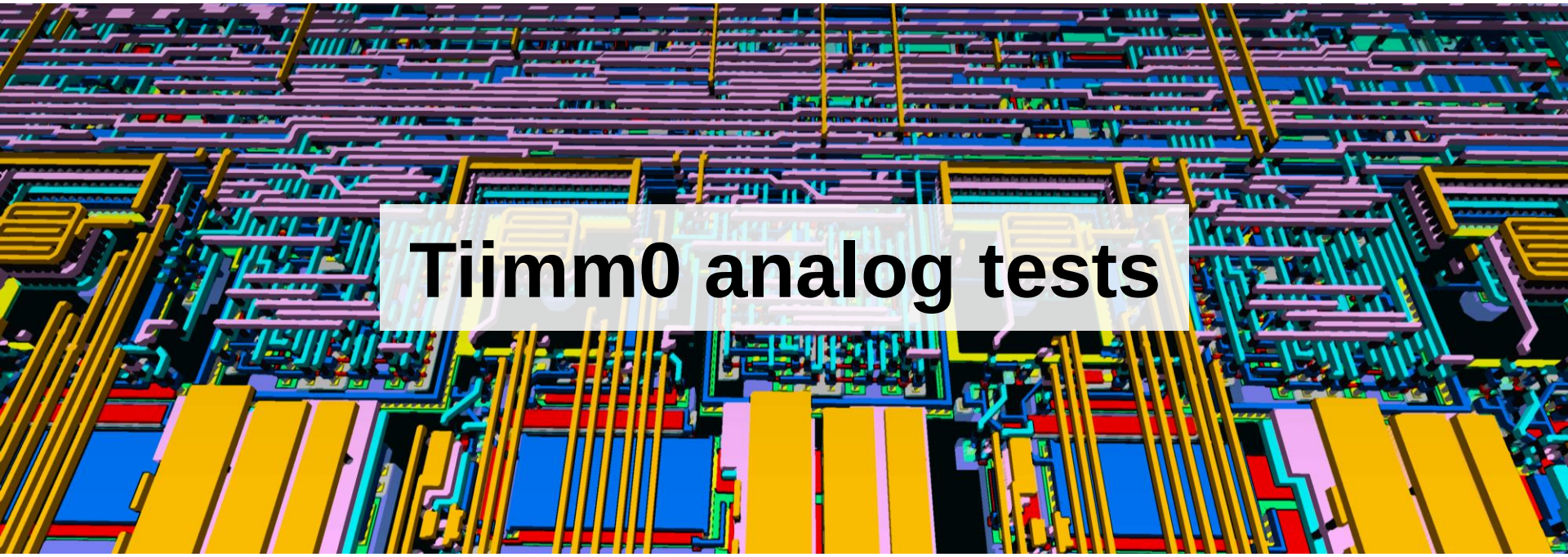


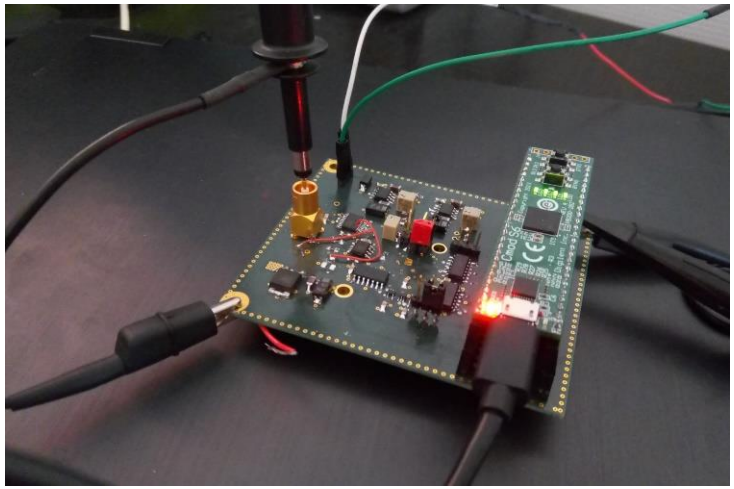
Tiimm0 analog tests

Maciej Kachel

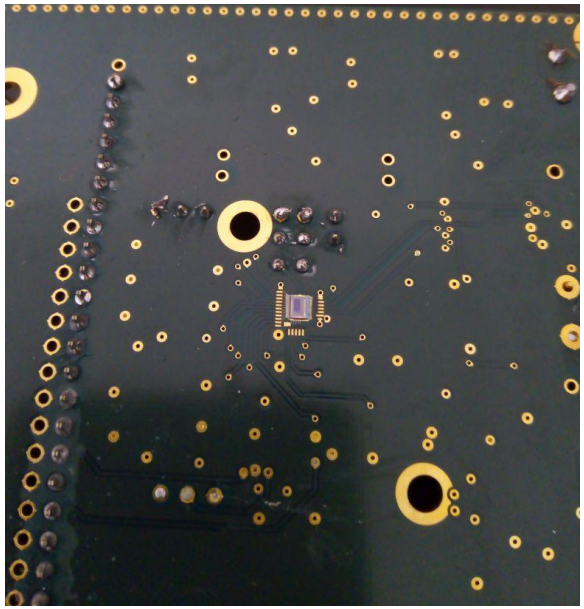
11/02/2021

Measurement Setup

- SETUP
  - CMOD S6 Digilent module (FPGA)
  - Tektronix TDS5054 scope
  - Keithley 237 current source (Bandgap problem)



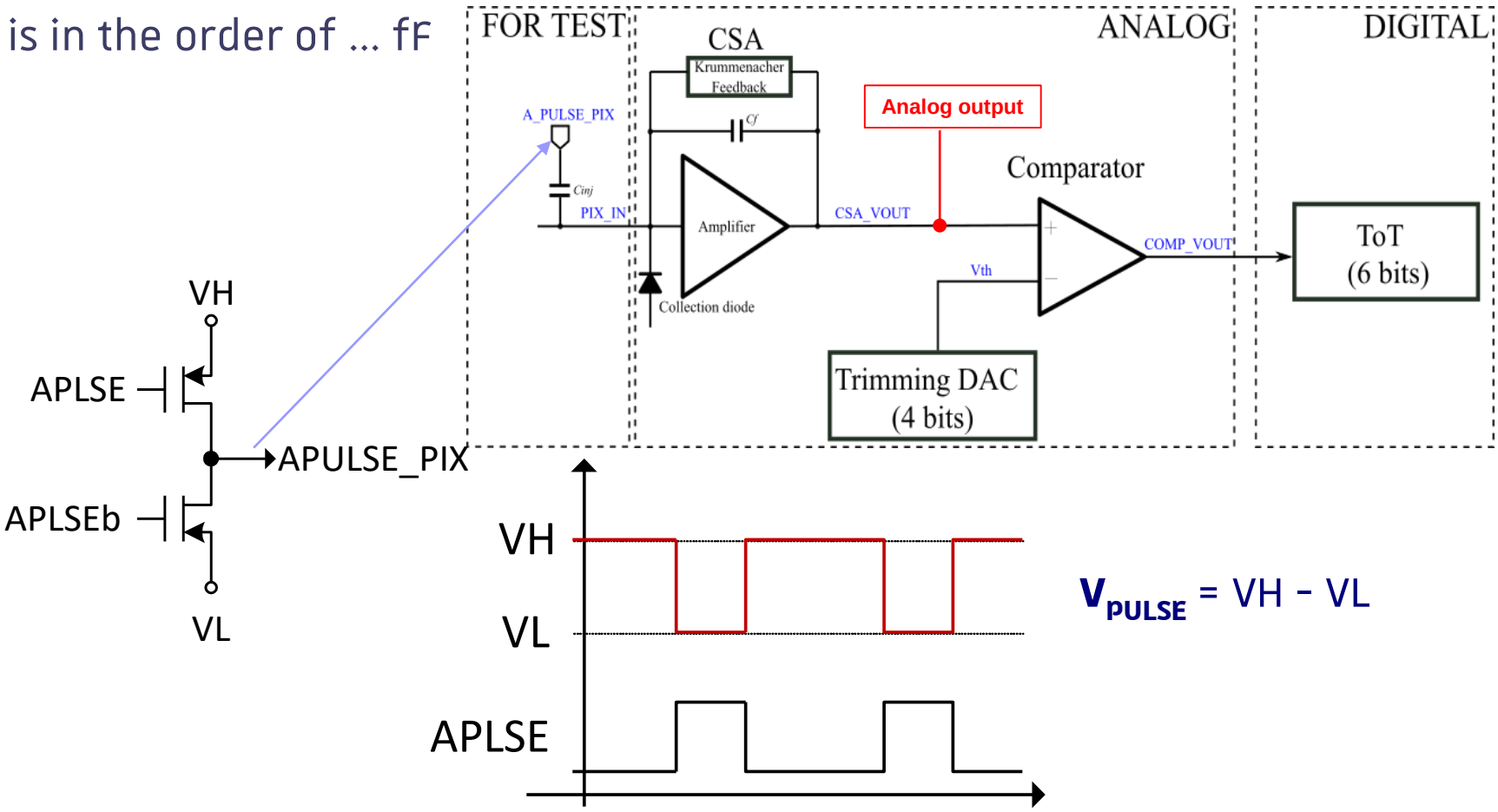
- PROCEDURE:
  - Reset chip (SPI)
  - Load DAC values (SPI)
  - Inject pulse (generated by FPGA)
  - Record the analog output on the scope



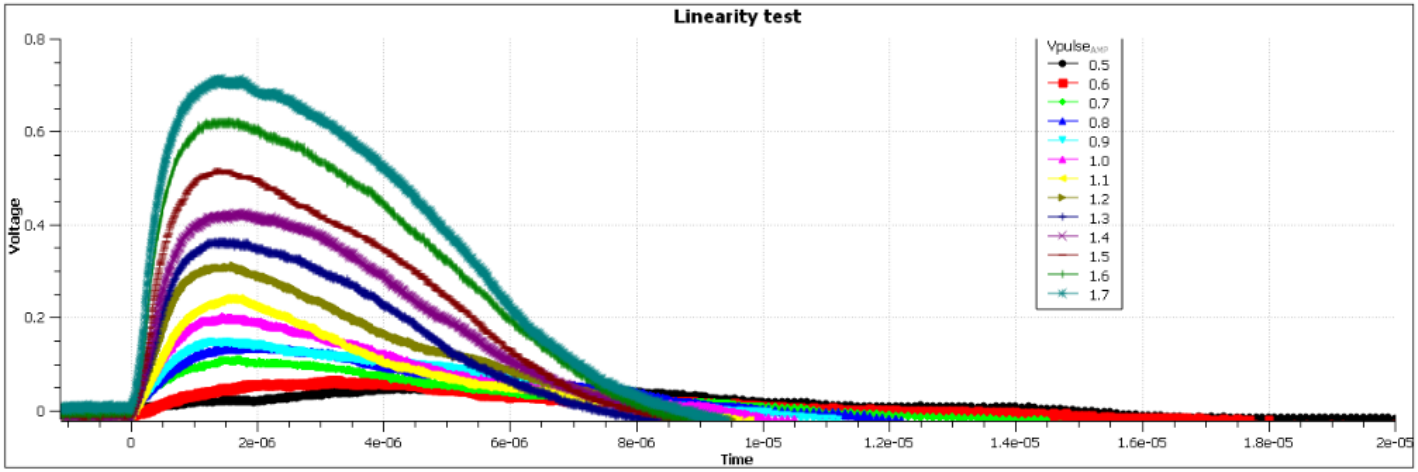
- Limitation => single pixel at a time

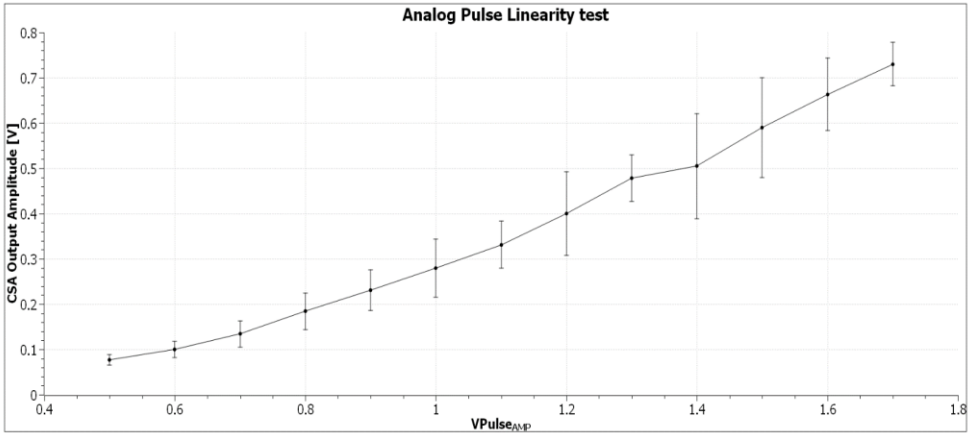
Tiimm0 pulse injection circuit

- VH and VL are generated by the DAC
- APLSE is an external signal controlled with FPGA
- C_{inj} is in the order of … fF



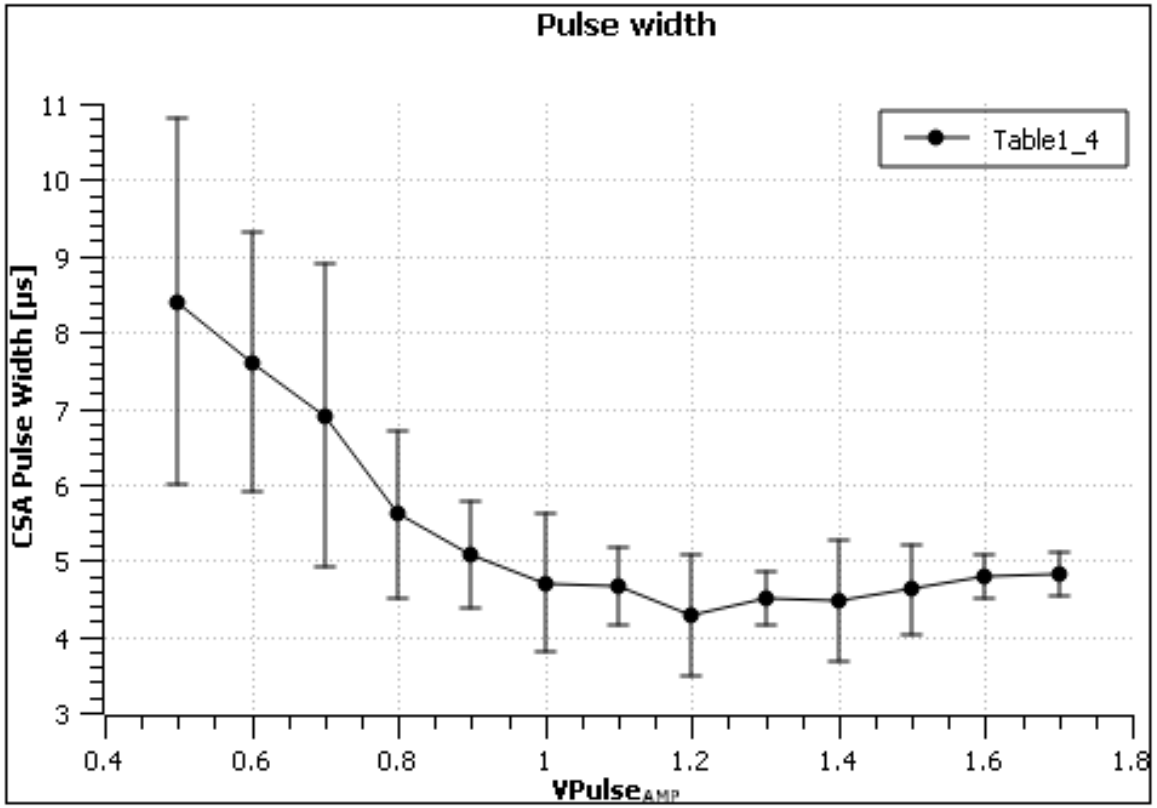
Linearity test – CSA amplitude in function of V_{PULSE}





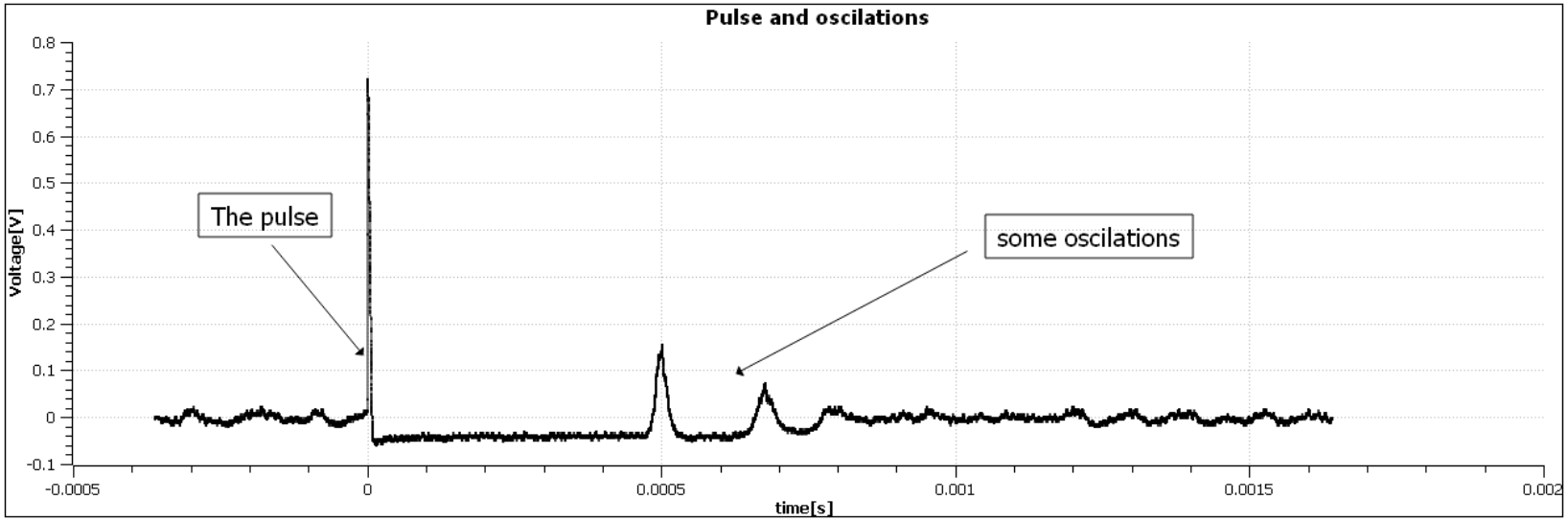
- The errors are quite big, the amplitude of the signal fluctuates -> might be due to the injection circuit
- Can't give the gain since we don't know what do we inject => calibration needed

Pulse width -> problem?



- Data taken from the « Measurement » function of the Tektronix scope => not 100% reliable
- But in the linearity test, the change of pulse width was not monotonic

Overshoot and oscillations



- **Overshoot after the pulse restoration**
- **Oscillations are 'dying out'**
- **This does not influence the counting in pixel (there is a logic that protect against double counts)**

Tiimm0 measurements – TO DO list

- Tests with the X-ray source
  - Calculate the gain (and noise)
  - Measurements in function of Substrate voltage not possible
- Tests with a Beta source
- Passing the test-bench to Weiping

Tiimm1 Submission timeline

	February	March	April	May
Analog simulations				
Analog layout				
Digital simulations				
Digital layout				
Matrix assembly				
TOP simulations				
TOP Assembly And verification				