Karlsruhe Institute of Technology

► HV-CMOS

30.09.2014

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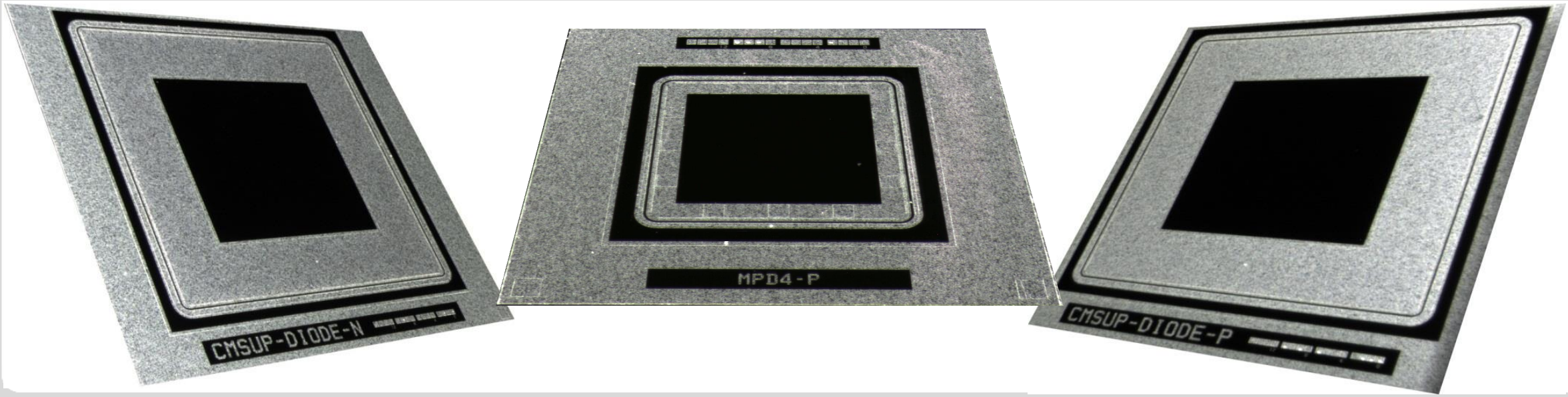
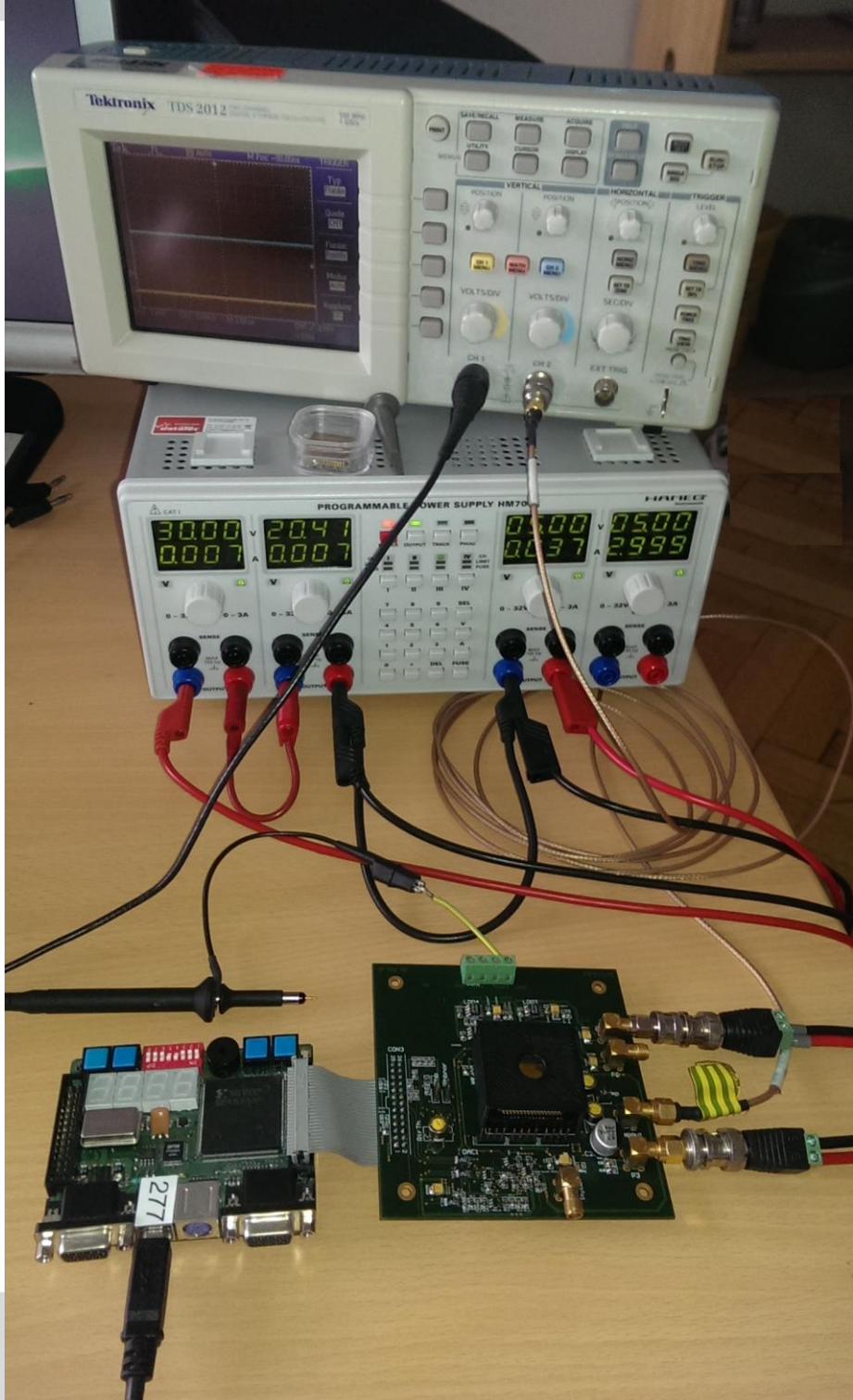


Overview of Components

- Uxibo (FPGA board, Spartan-II)
  - Readout framework provided by Ivan Peric
  - Simple wiring done for H35
- HV-Board
  - Complete assembly at KIT
- HVStripV1 Chip (HV-CMOS chip to be tested)
  - Some difficulties with bonding
  - 2 Chips available atm
- Voltage source (5V supply)
- HV source (~ – 60V bias voltage)
- Oscilloscope (TEK, up to 1GHz, 5GS/s available)
- Sr-90, Fe-55 sources available



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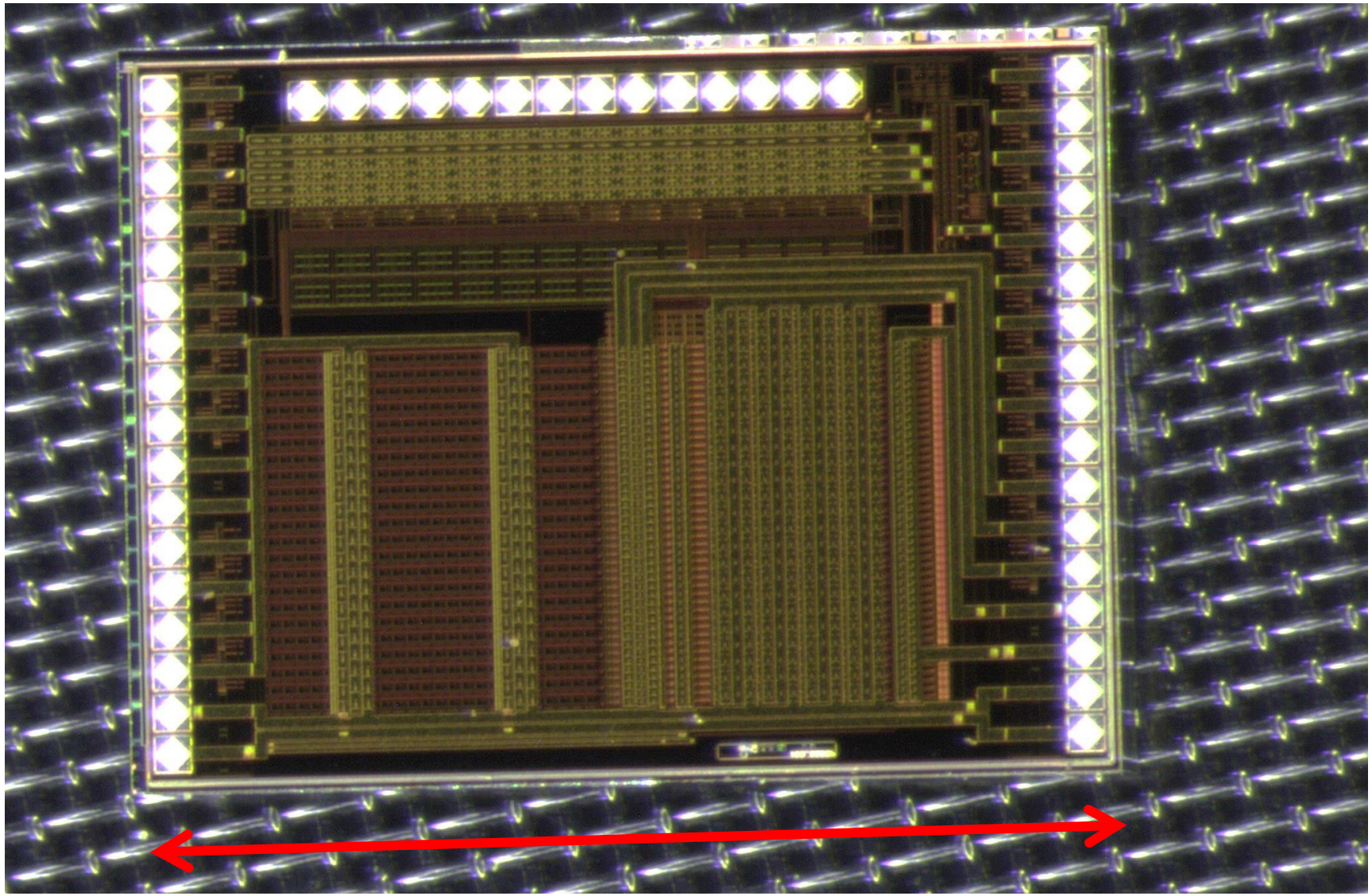
H35 Chip under the microscope



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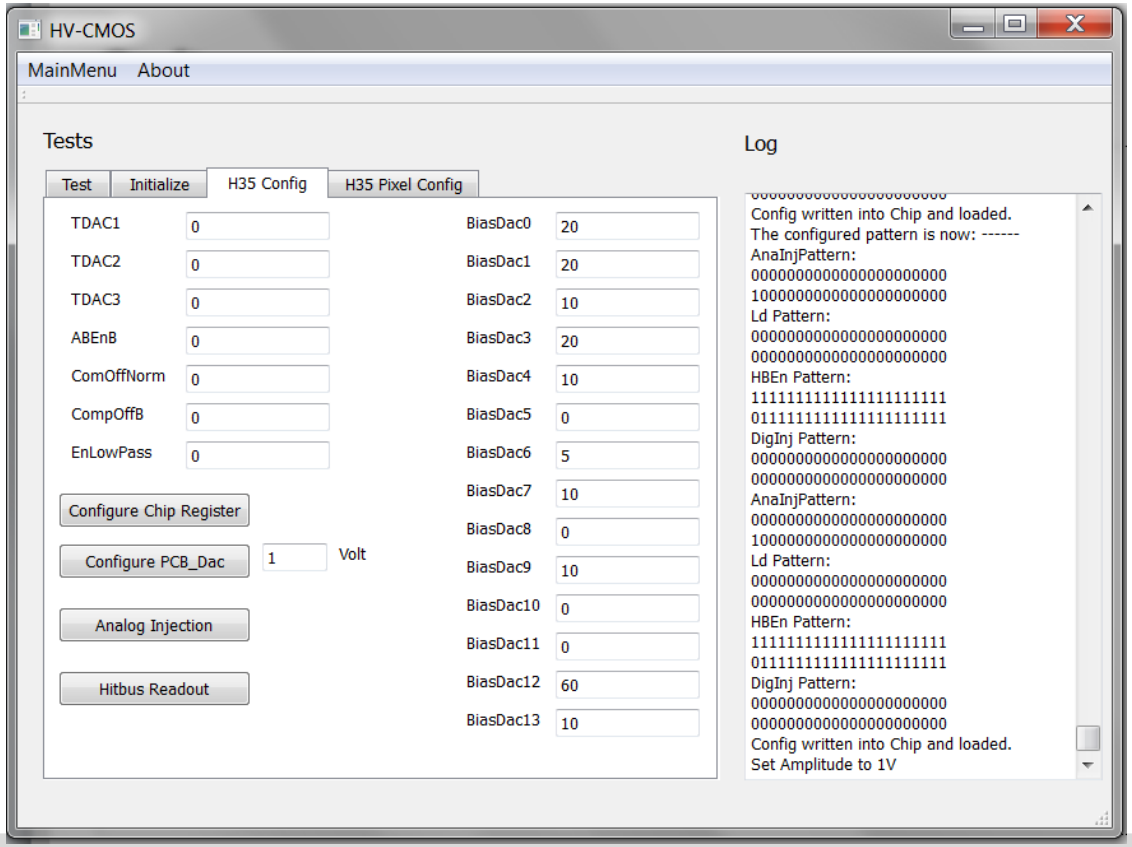
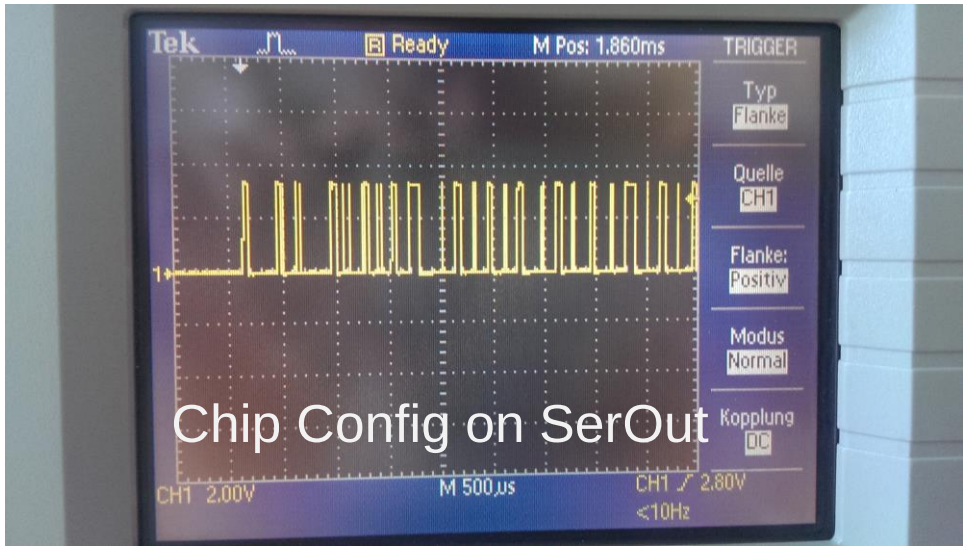
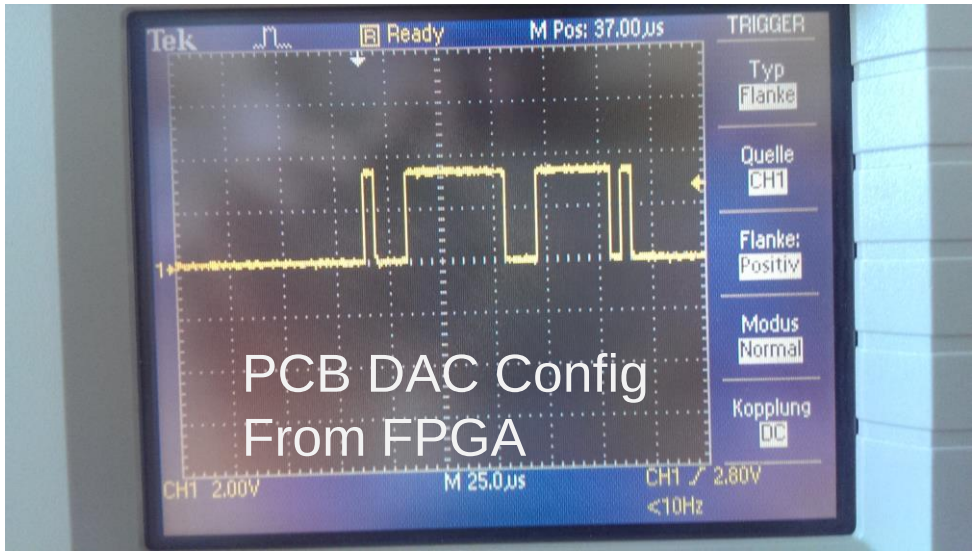
Software

- Configuration to Chip working
  - Output visible on SerOut
- DACs on PCB configurable







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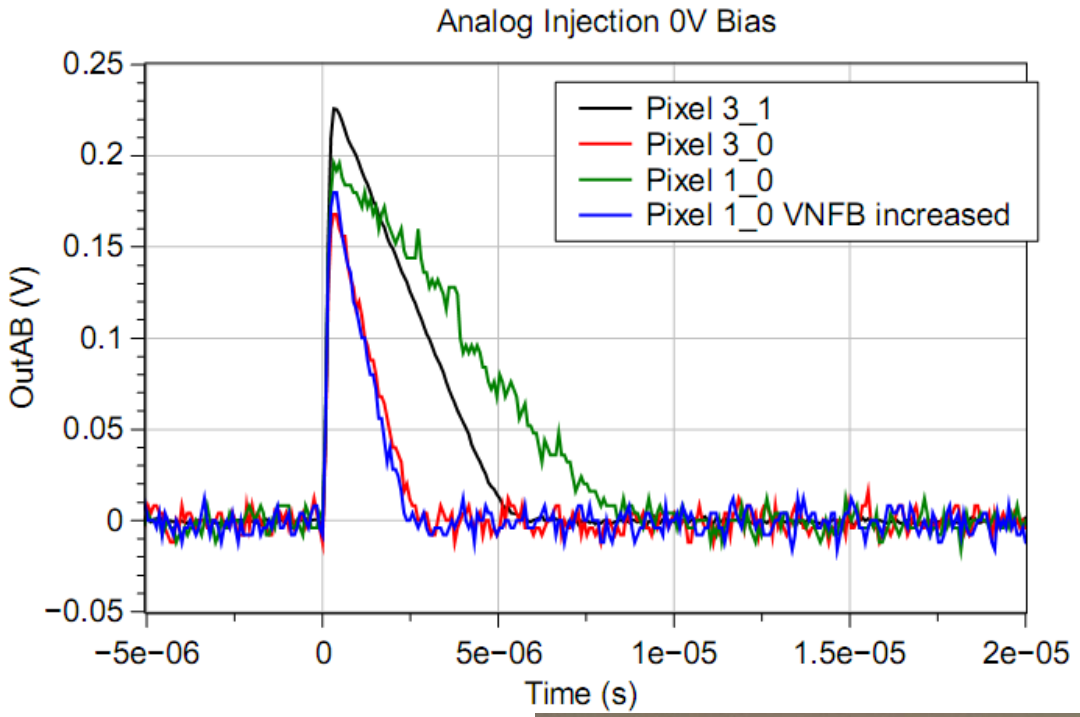
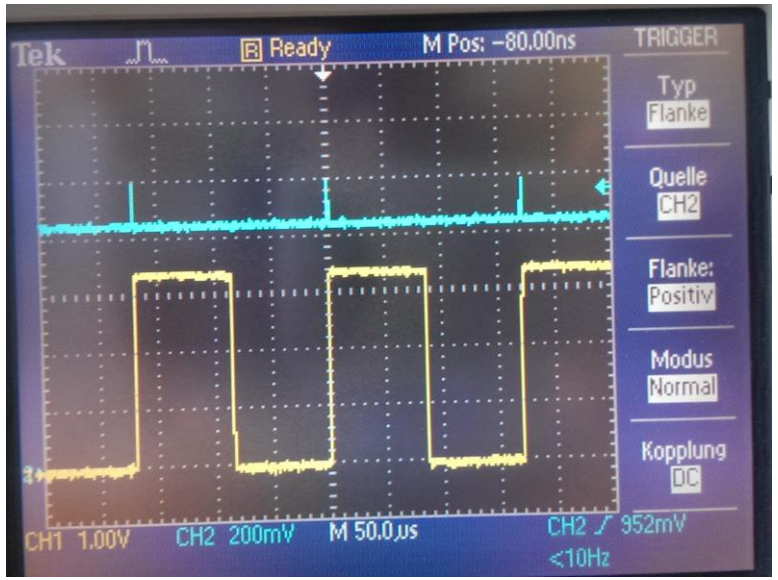
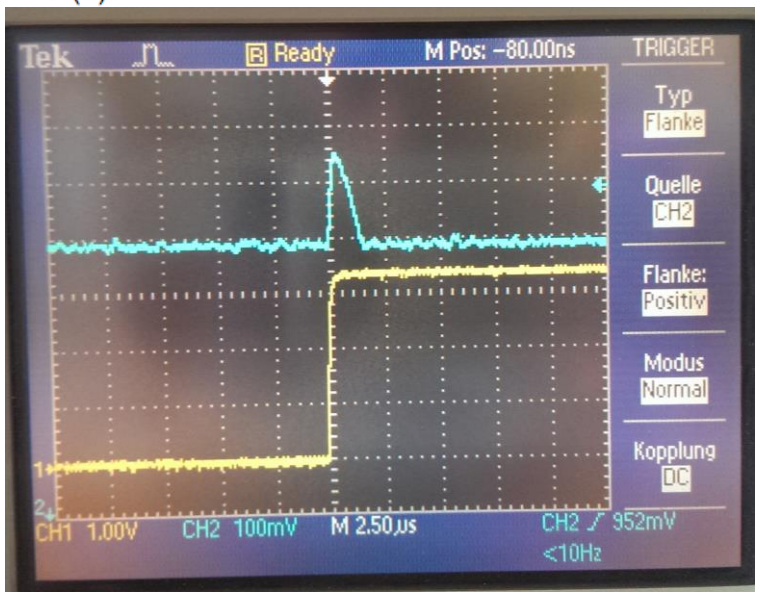
Measurements

- Analog Injection into Pixels
  - Output on OutAB



Pattern





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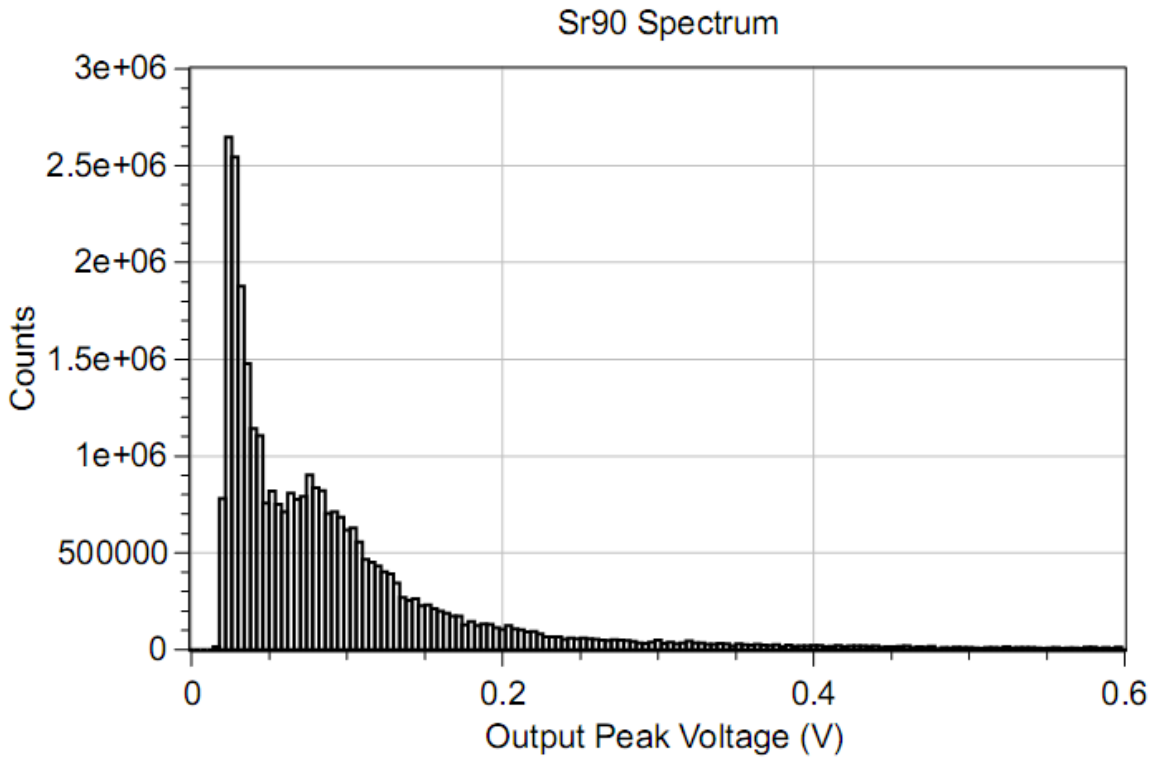
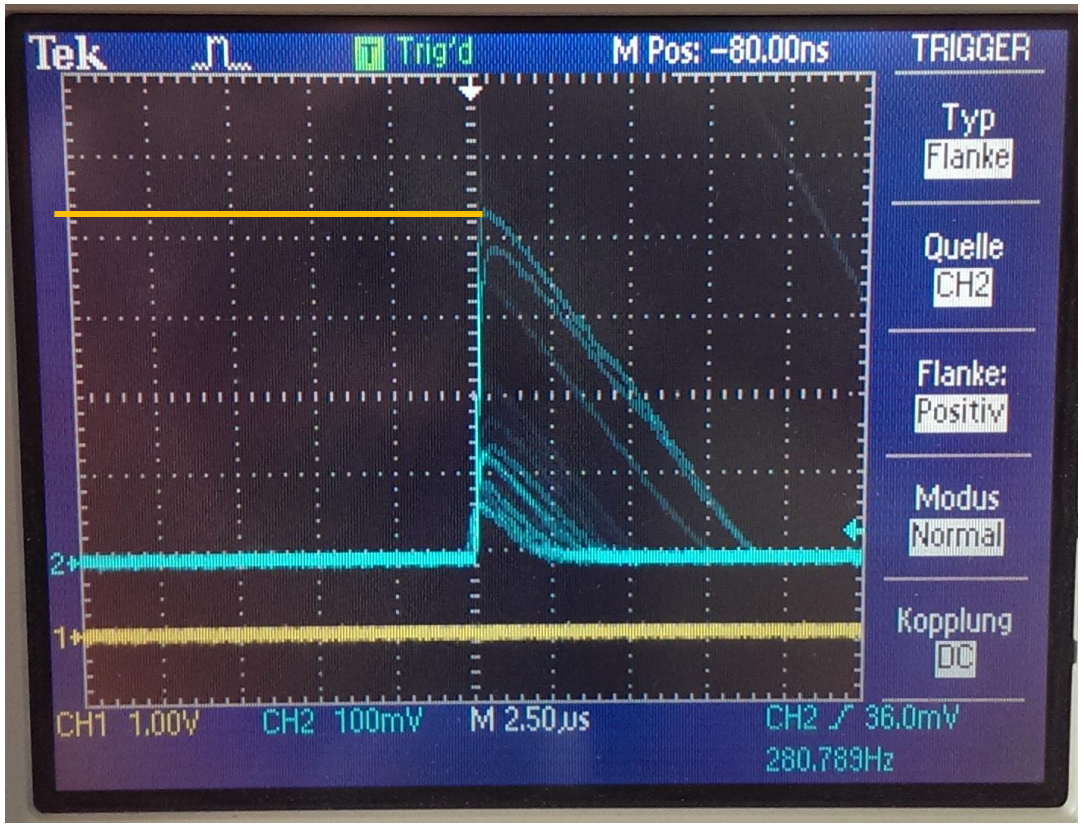
Measurements

- Test with SR-90 source (MBq)





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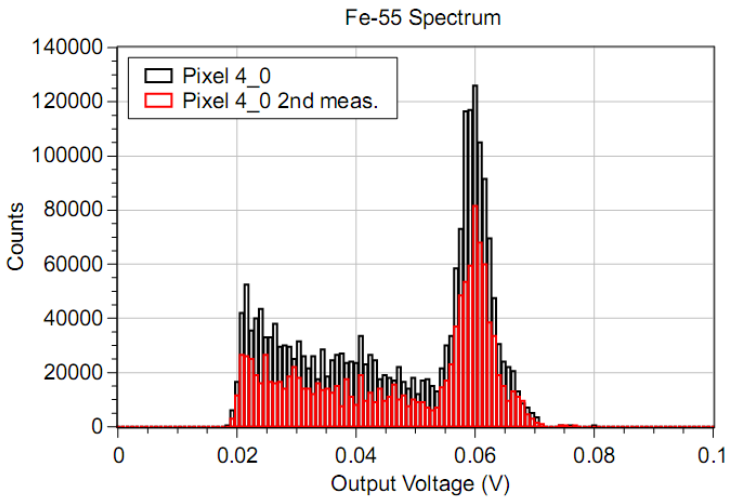
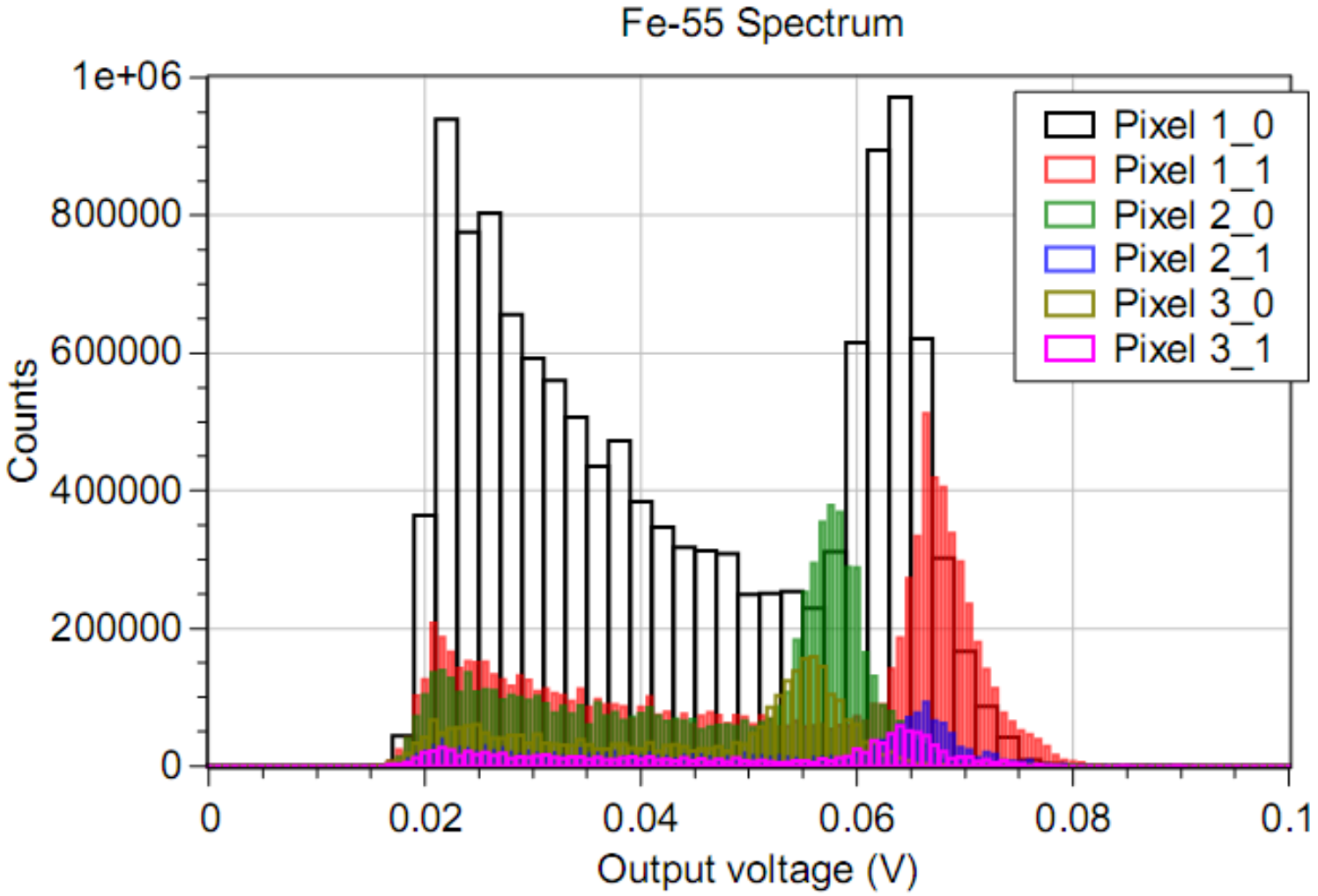
Measurements

- Calibration with Fe-55 source
- Bias: - 60V
- Activity: ~8MBq





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Plans

- Irradiation with X-Rays
  - X-Rays @ KIT: 60keV, 30mA, 10kGy/h
    - 60h for 600kGy (60MRad)

- Irradiation with 23MeV cyclotron protons
  - 1e15n_{eq}/cm^2 reasonable. Preferences?
  - Also a lot of ionizing dose (~1.5MGy)

- Digital readout of the chip
  - Few more steps in FPGA wiring and software configuration

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