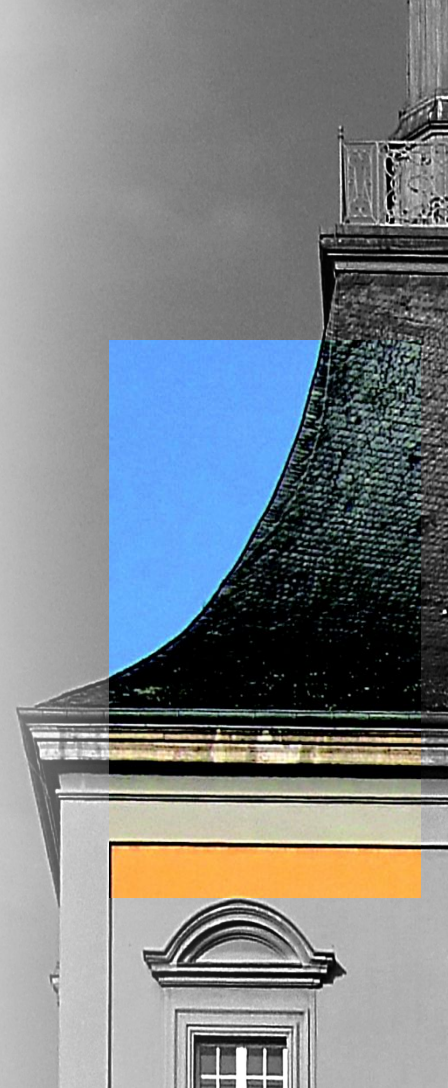


COMPASS FE MEETING
**UPDATE ON THE APV
FRONTEND**

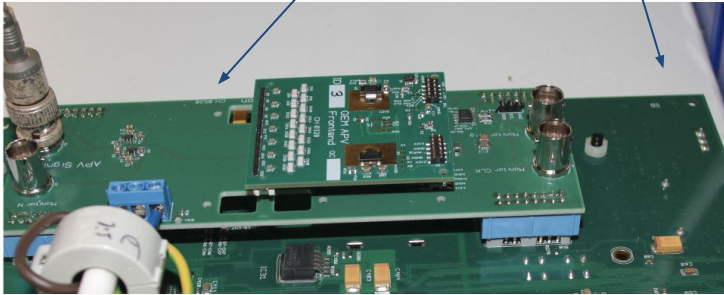


Overview :

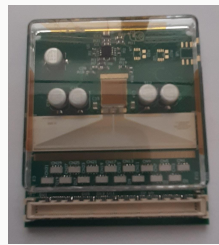
- 1) APV Front-End
 - Tested, 54 units in production
- 2) Stabilized Voltage Divider
 - Preliminary results promising
- 3) Discharge Simulator
 - Discharge protection works
- 4) Supply Card (Interface to ADC)
 - Prototypes ready
- 5) New APV ADC
 - Production Scheduled for Jan 21
- 6) Detector Status
 - Padplanes + GEMs arrived, assembly in progress

APV Frontend

- 3 Prototypes tested, ENC measured
- Tested with Test Station + existing ADC



- Todo: Measure ENC vs C_{Detector}
- **54 more frontends in production.**
- Estimated to be ready: End of Feb 2021



ENC for SN3:

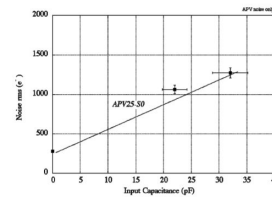
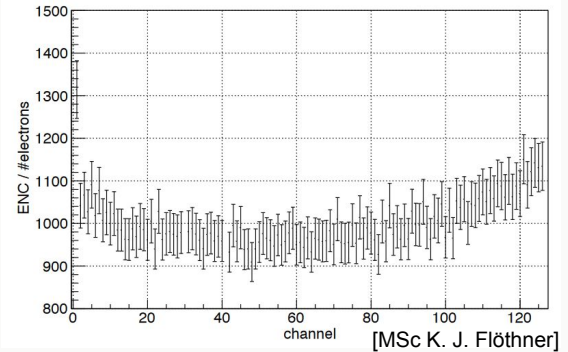


Figure 6.11: Computed (full line) and measured input noise as a function of strip capacitance for the APV25 S0 [33].

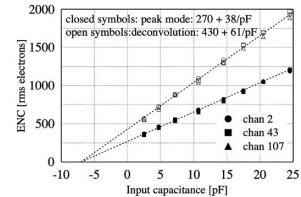
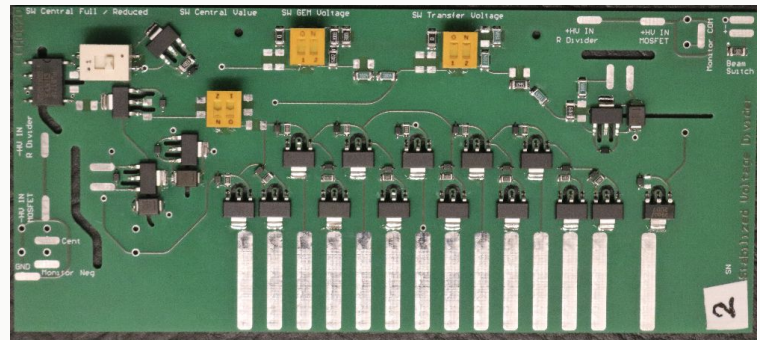
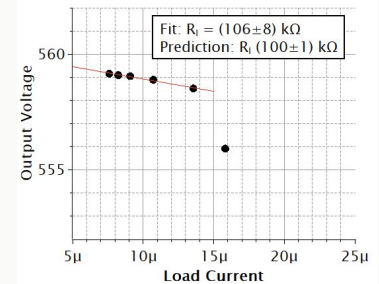
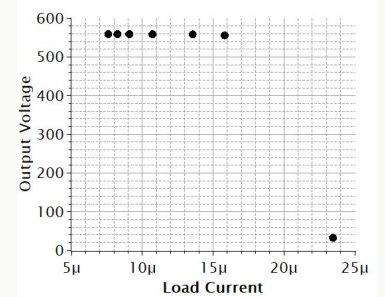


Figure 6.12: APV25 S1 noise against input capacitance [49].

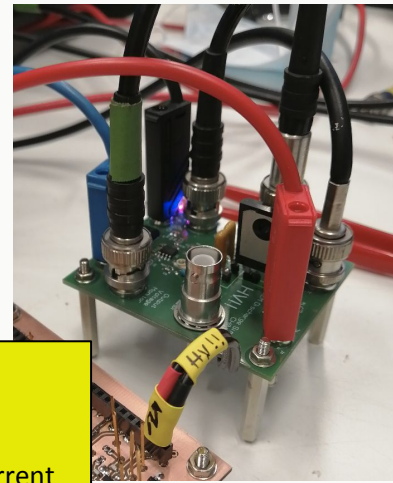
Stabilized Voltage Divider

- Prototypes assembled + being tested
- Preliminary results:
 - Current Limiting Works: $I_{Max} \sim 15\mu A$
 - $R_1 \sim 100k\Omega$ (Old: $10M\Omega$)
 - Scenario: Short circuit on segment A
 - V_A drops to $0V$, $I = 16\mu A$
 - Voltage on neighboring segment drops by $\Delta V_B = \sim 13mV$
- Todo:
 - Full characterization
 - Test in detector



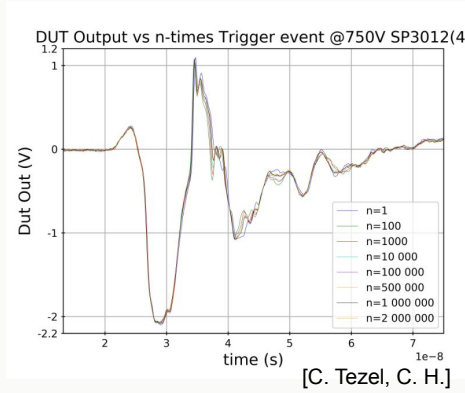
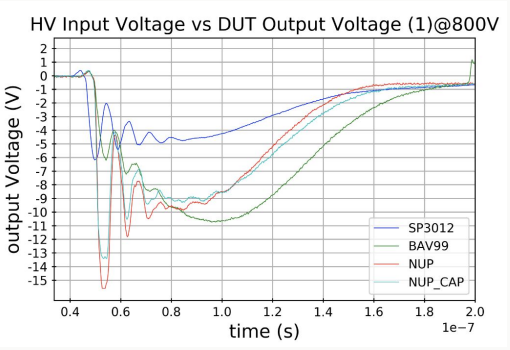
Simulation of Discharges

- APV FE has protection against discharges
- Different scenarios tested
 - Discharge protection works
 - Long-term stable



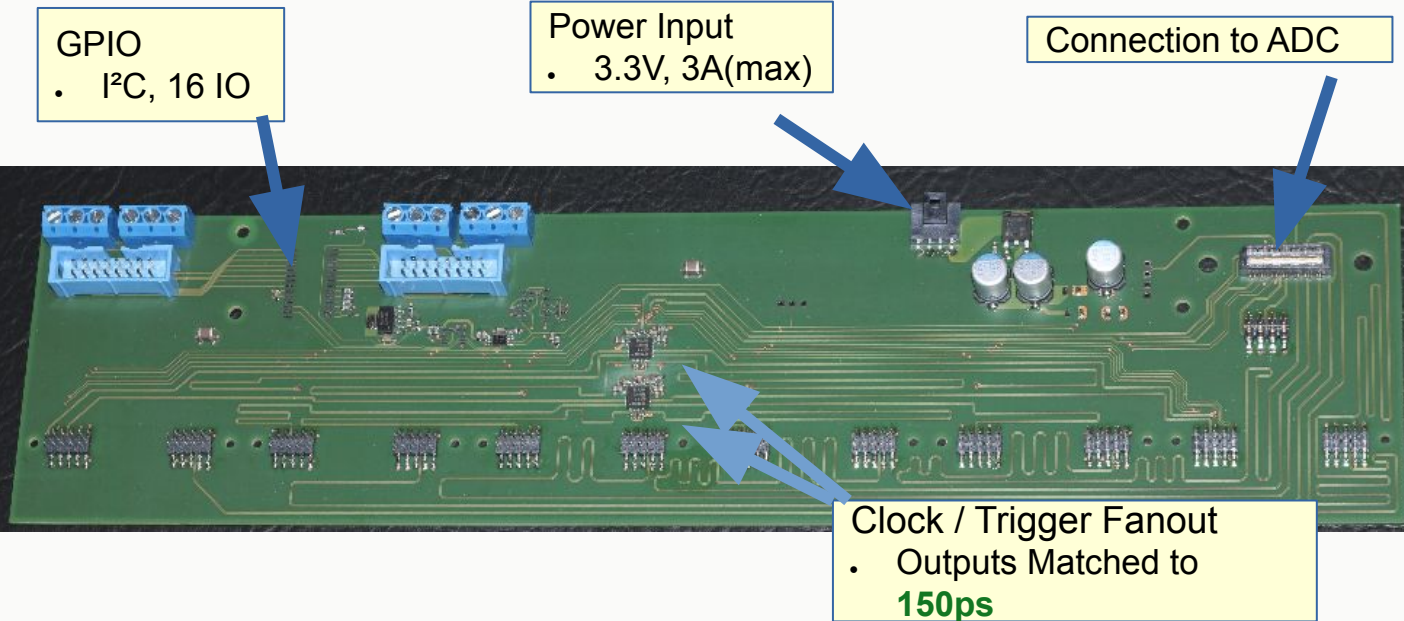
Discharge Simulator

- Up to 800V / 800nC
- Monitoring Output
- Measure Voltage/Current
- Fast rise time



APV Supply Card

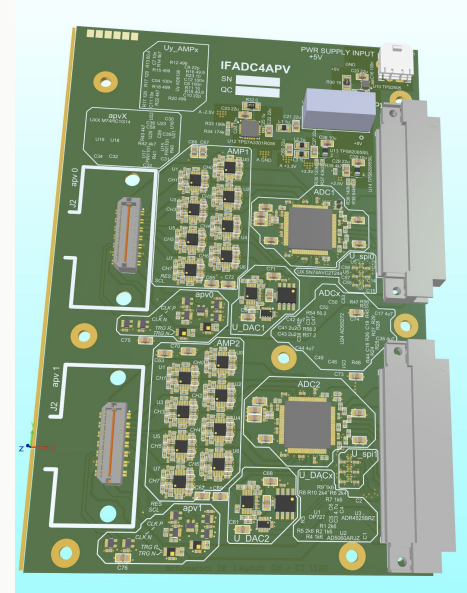
- Prototypes ready, not yet tested



New APV ADC

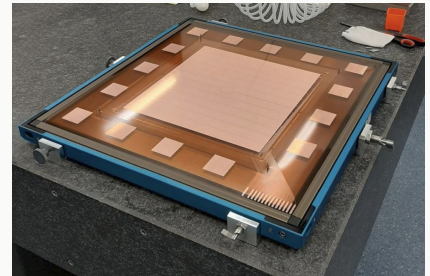
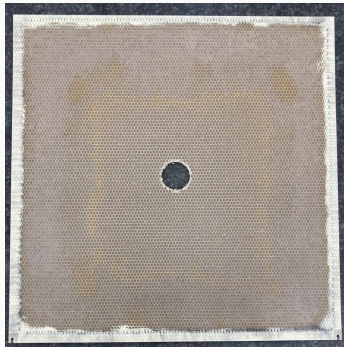
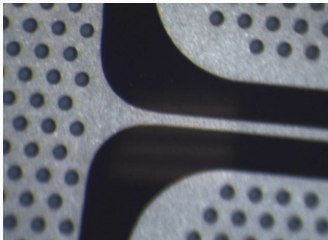
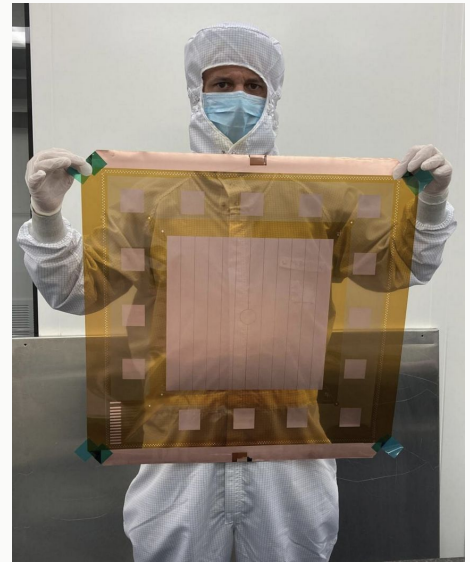
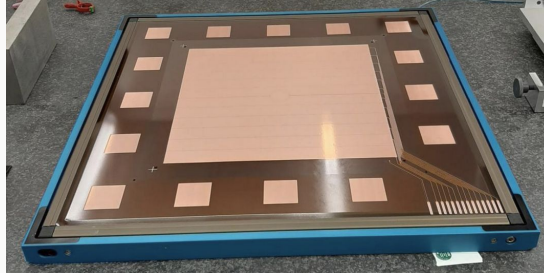
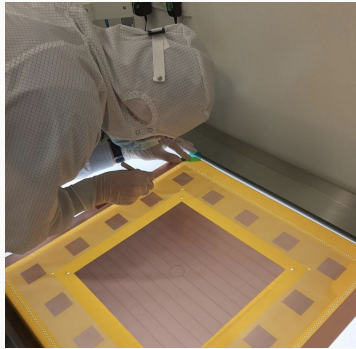
- 16 Channels, 12 Bit, 65 MSPS
- 2 units needed for one GEM detector

- Schematic: I. Konorov
- Layout: C. Tezel, C. H.
- Assembly:
 - 3 Prototypes
 - Done in Bonn
 - Scheduled for January



New Detector Status

- GEMs + Padplane arrived in Bonn
- Assembly in Progress



Overview :

- 1) APV Front-End
- 2) Stabilized Voltage Divider
- 3) Discharge Simulator
- 4) Supply Card (Interface to ADC)
- 5) New APV ADC
- 6) Detector Status

