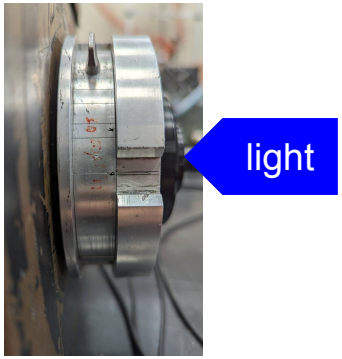
# SiPM single-photoelectron measurements

## an introduction

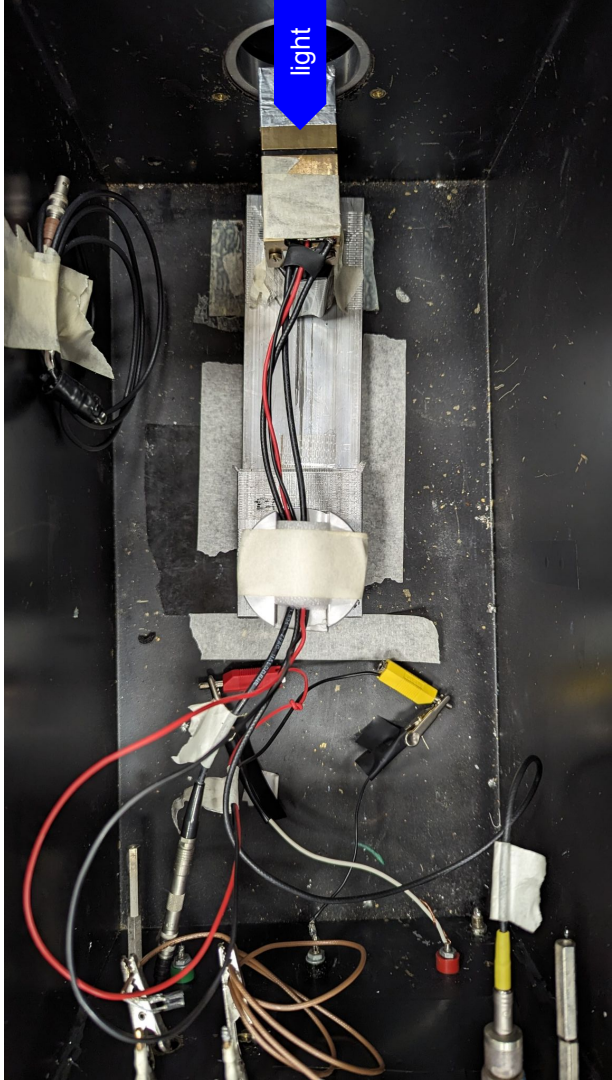
# setup

light-tight brass box

blue LED + polarising filters to reduce the amount of light into the box → on the SiPM




outlets for signal and slow control cables

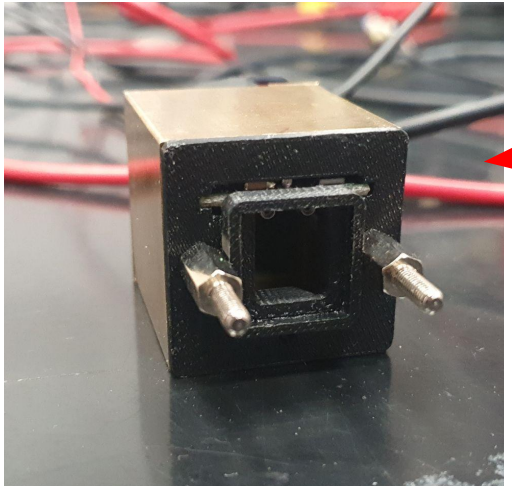


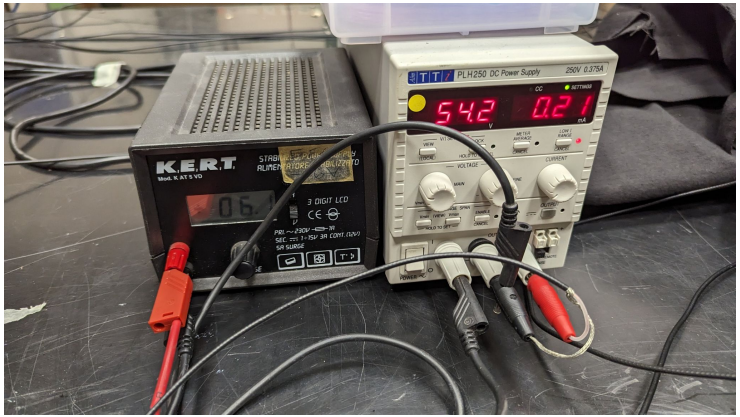

courtesy of Ivano Sarra

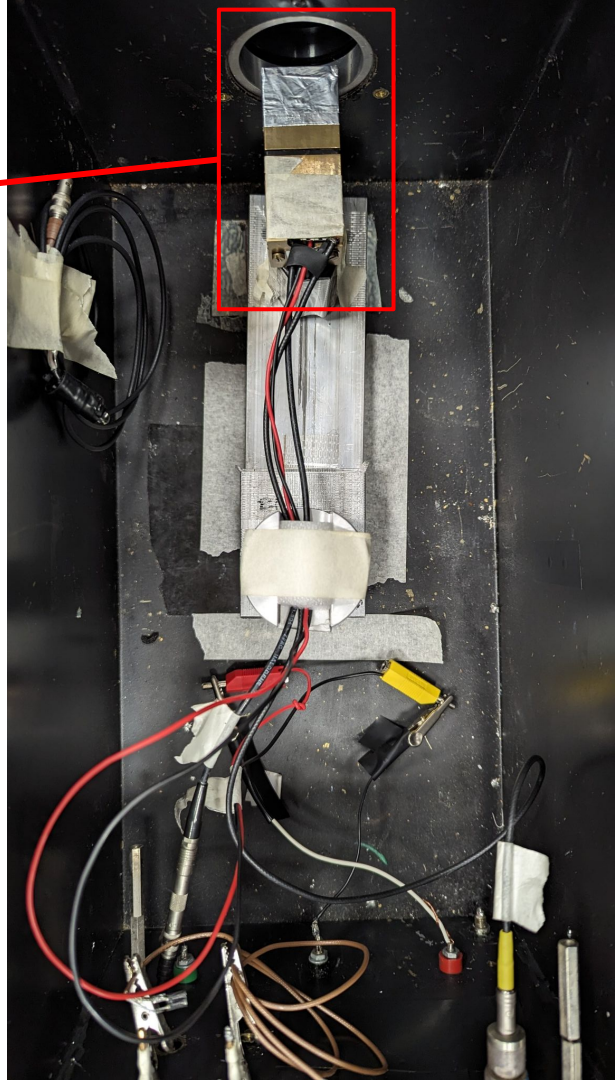
# setup

high-gain (300x) amplifier
⇒ measurement of the SiPM dark current or single-photon response

to be compared to the amplifier we used in 2023, which has a gain of ~4x





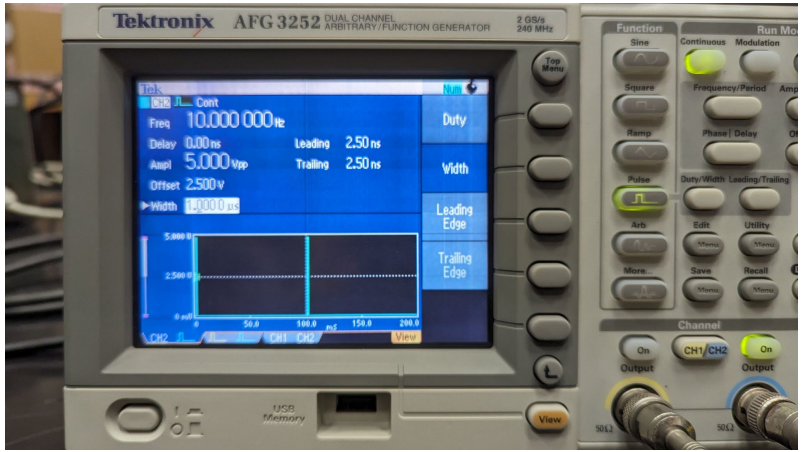
courtesy of Ivano Sarra

# setup

waveform generator to control the light emission: Tektronix AFG3252

TTL trigger, also sent to the DAQ
(w/ 400 ns external delay)

pulse for the LED





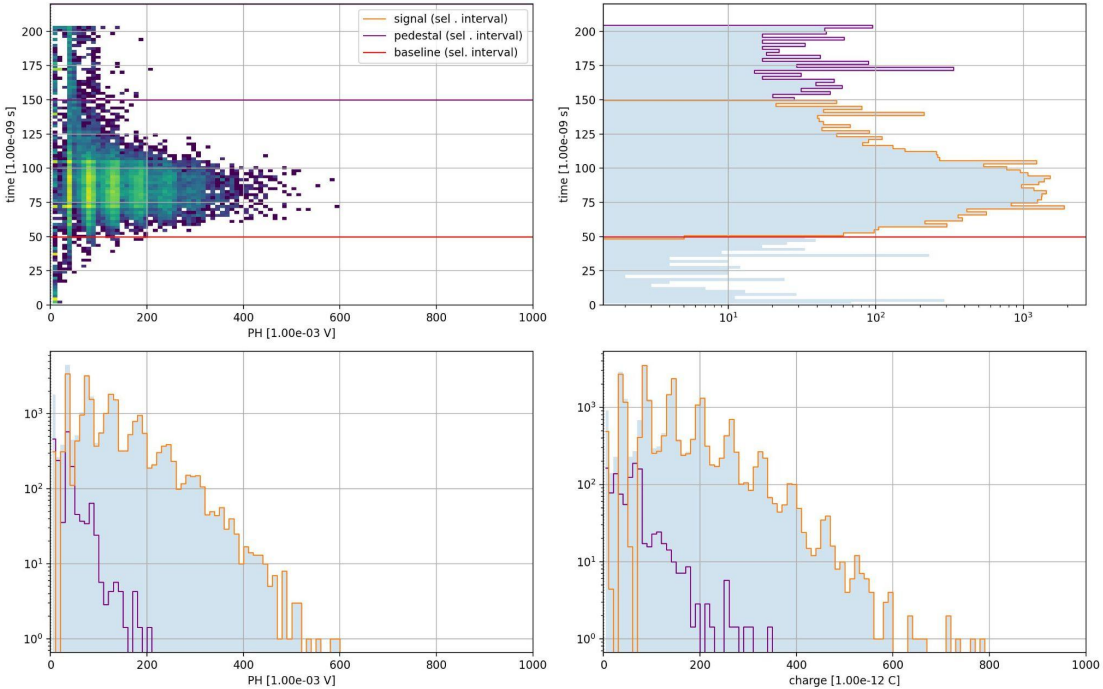
amplifier output to a CAEN V1742 (1 Vpp range, 200 ns acquisition window @ 5 GHz)

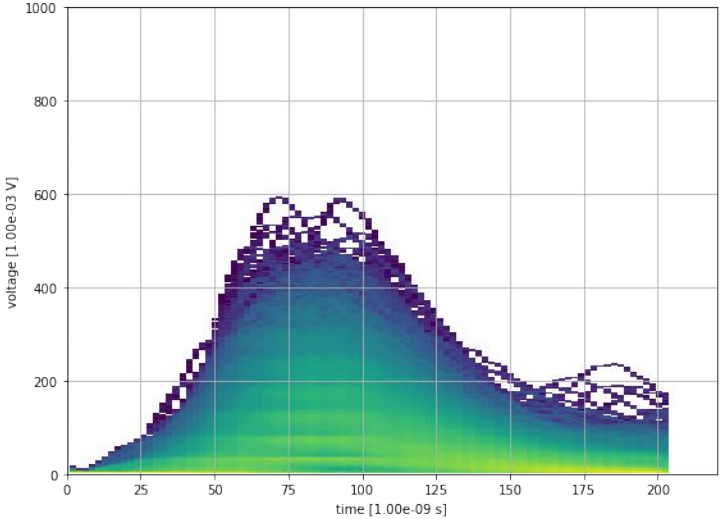
DAQ SW: the usual, based on CAEN WaveDump

# preliminary results

test w/ one of our [Hamamatsu S13360-6050CS]

- @ Vop (~54.3 V)
- straight into the amplifier with its pins i.e. without cables



the setup is ready to start characterising all our sensors!

analysis can (and should) be refined

electromagnetic noise is overwhelming already with a cable of a few tens of cm ⇒ we should really consider removing the Cachex 2 cable and turning to another approach – without soldering?

backup

preliminary tests and hardware details are documented
here and here (private)

details on the DAQ are given here (private)