Next beam tests of RPWELL detectors for DHCAL

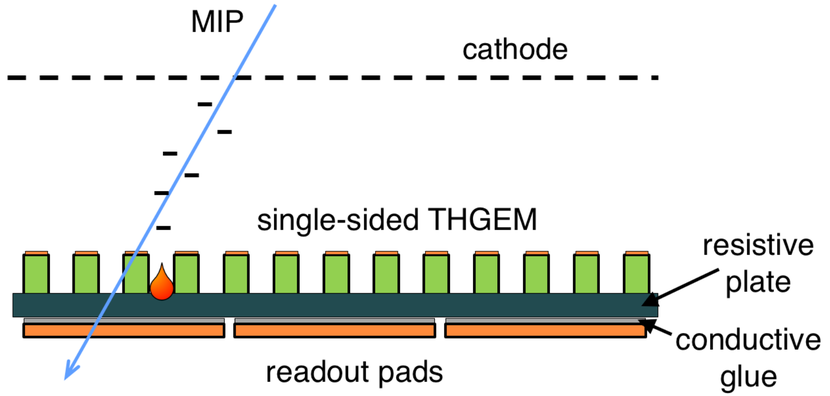
on behalf of WIS and Technion groups

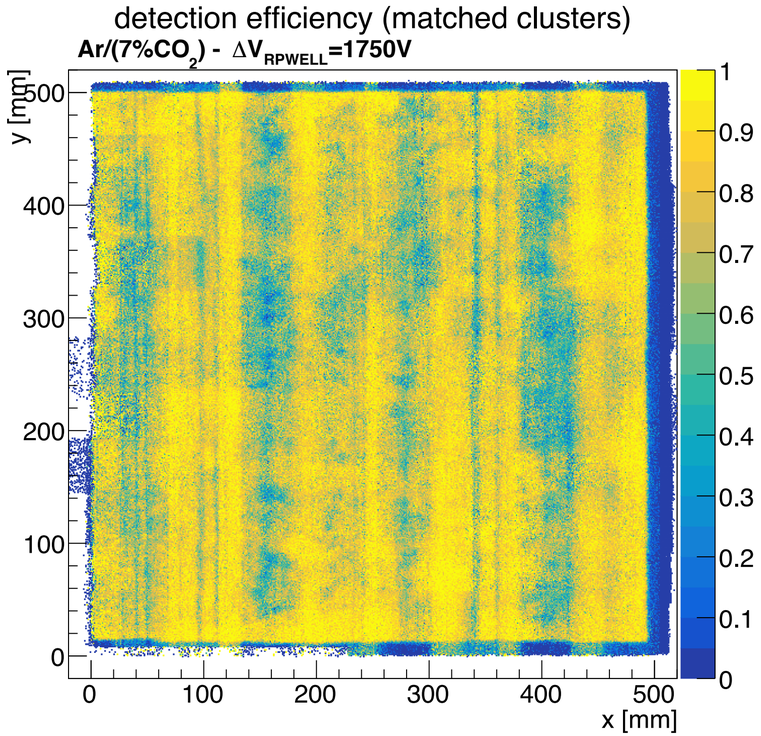
Luca Moleri - 19/02/21

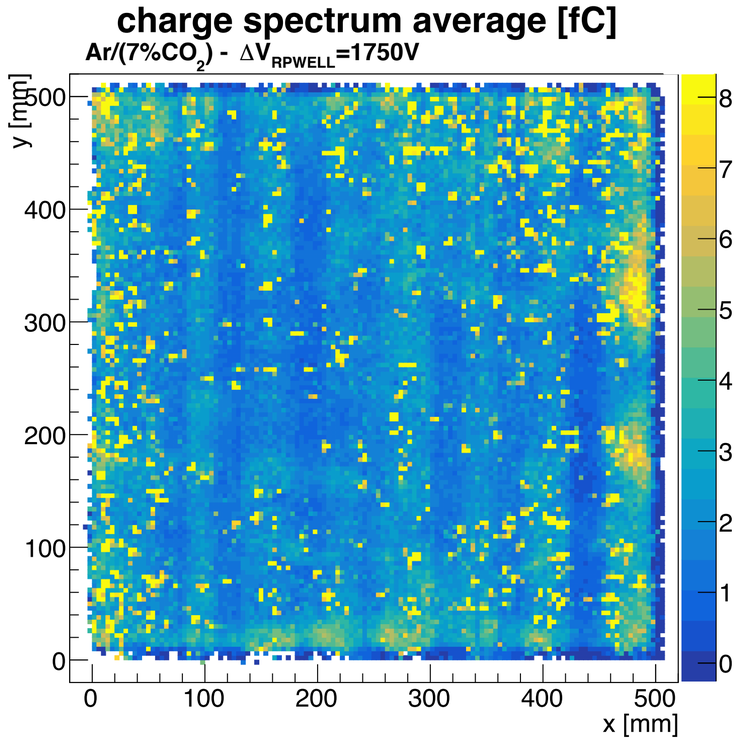
RD51 mini-week

The RPWELL detector

present prototype features







- large tickness non-uniformity
- electrical instabilities at operating voltage (yellow dots in gain map)

Next RPWELL prototypes

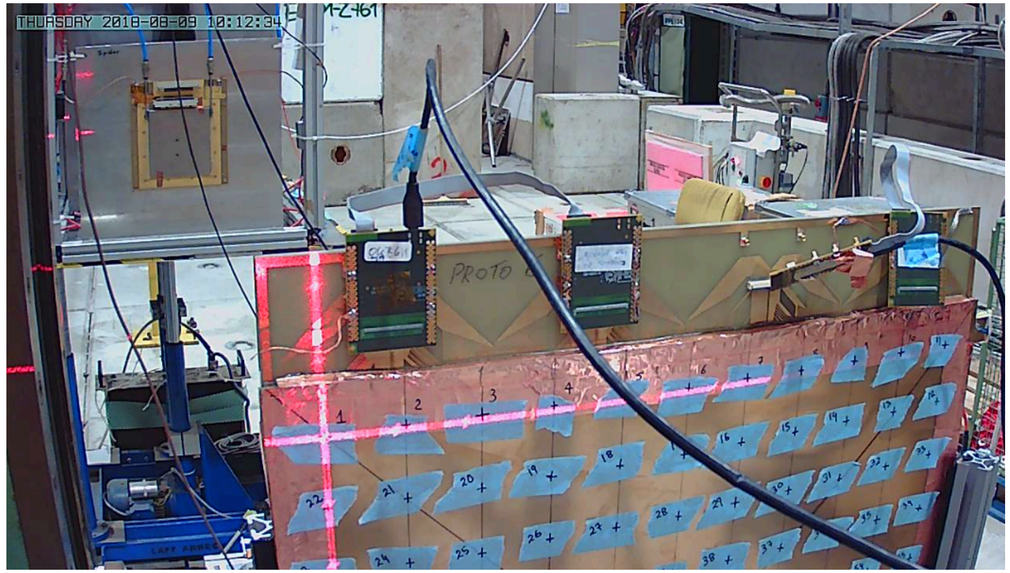
New electrodes and assembly technique

- Raw material with controlled thickness uniformity within 5%
- Hole free areas for local THGEM gluing on the RP
- Precise jigs for electrodes placement

The first prototype will have a 1-D strip anode coupled to the SRS-VMM3a readout
Prototypes coupled to the MICROROC ASU will follow

Beam test plans

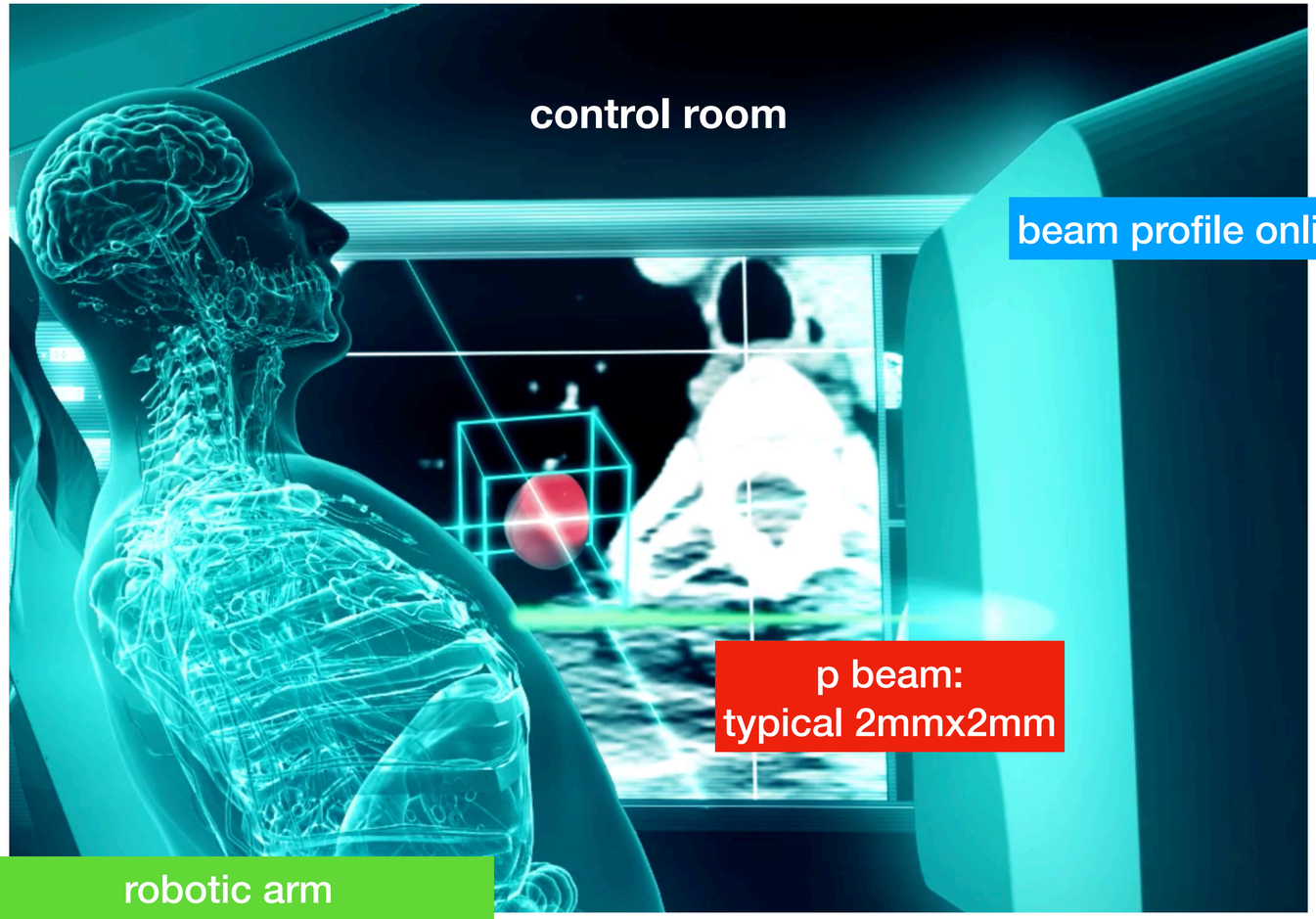
Controlling the detector positioning and alignment is a crucial part of the experiment



- Efficiency and gain maps with low rate muons
- Rate scans with pions
- Operate the SRS-VMM3a readout for the first time

p-cure facility in Israel

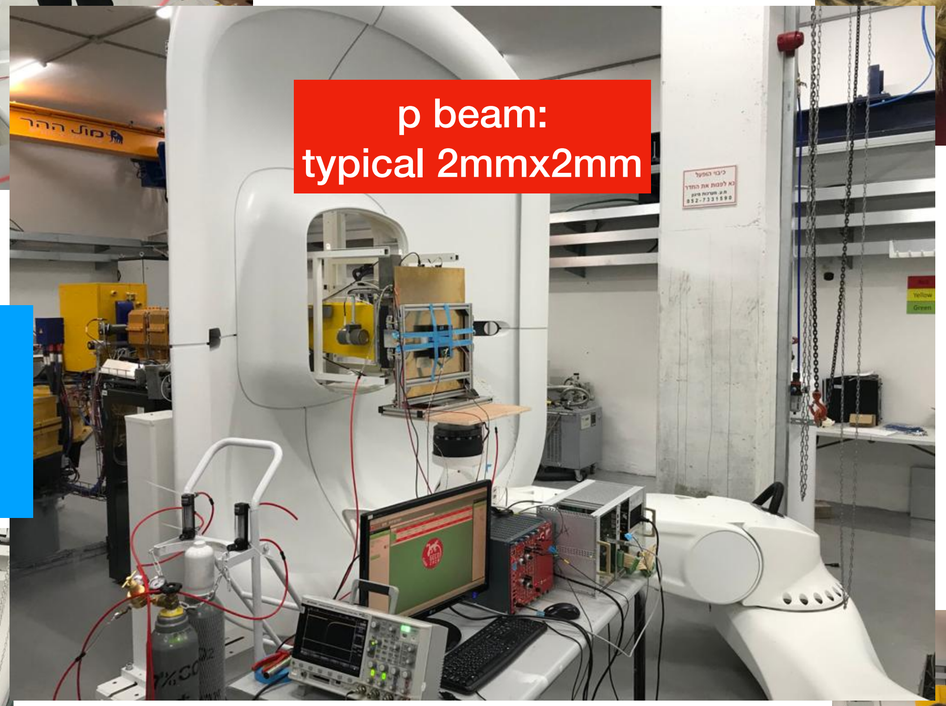
A proton therapy company with proton accelerator



proton accelerator
up to 250MeV

- typical rate:
  1s spill of 10^9 p

RPWELL on robotic arm
with precise movements



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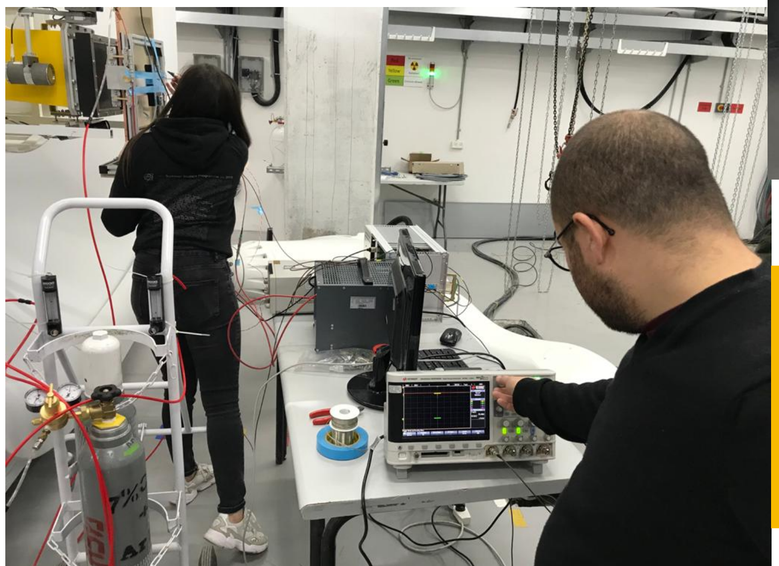

RPWELL setup

- Ar/7%CO_2
- HV
- readout
- scintillators and trigger logic

Beam tests at p-Cure (Israel)

first attempts and future plans

- An exciting opportunity to have proton beam tests “at home”
- Challenging gamma and neutron background
  - need for gas only trigger and tracker (GEM tracker under commissioning)
- New prototypes will be soon tested there. This might substitute basic beam tests at CERN