Towards RPWELL DHCAL: test of 50x50 cm² prototype construction

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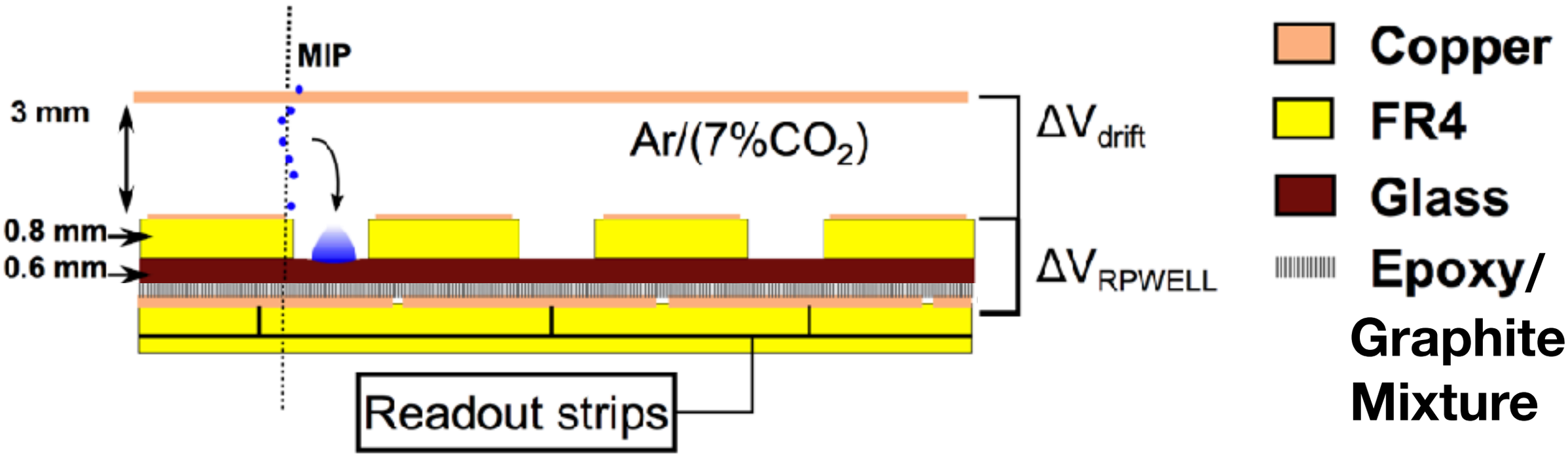
RPWELL DHCAL

- Large area RPWELL detector:
  - ➡Uniform detection efficiency
  - ➡Maximal acceptance
- Digital readout: MICROROC

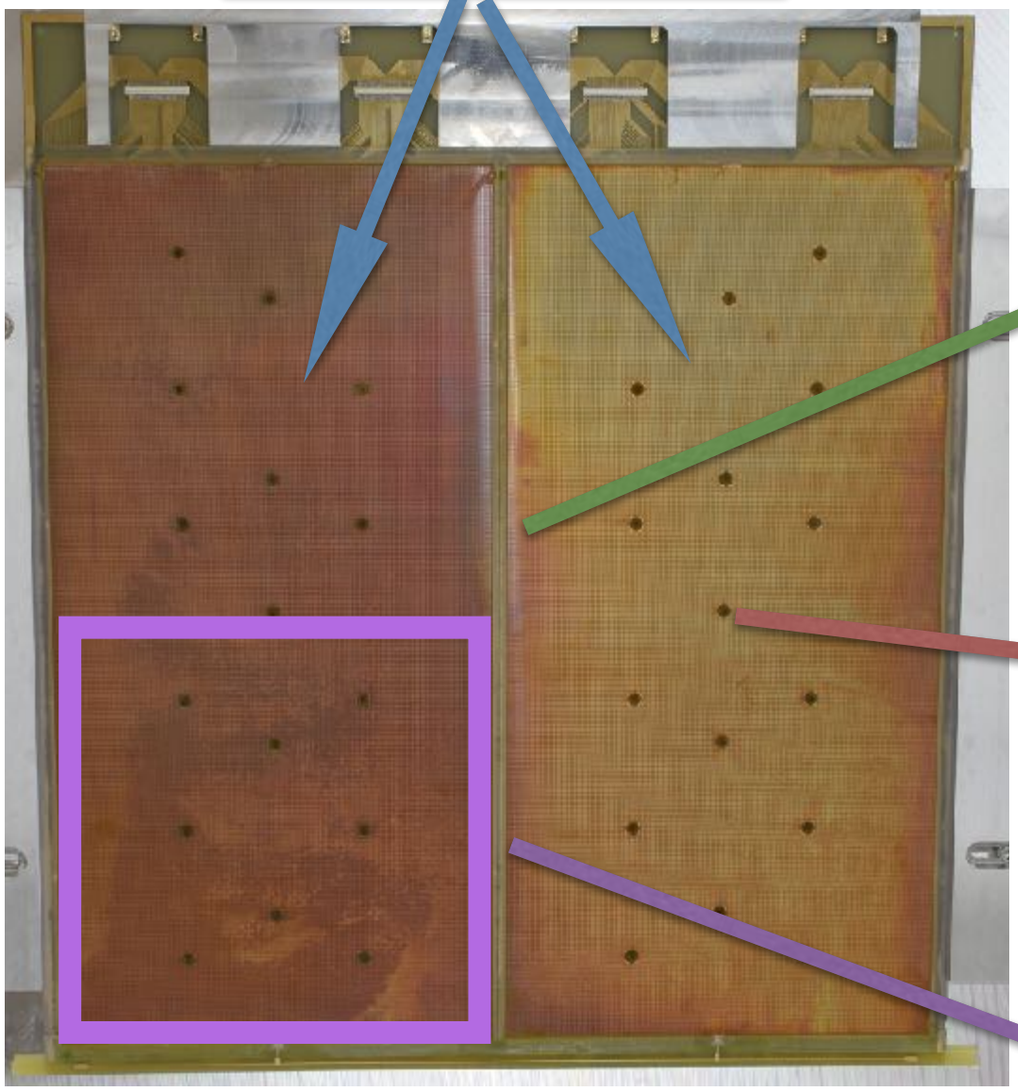
50x50 cm² RPWELL

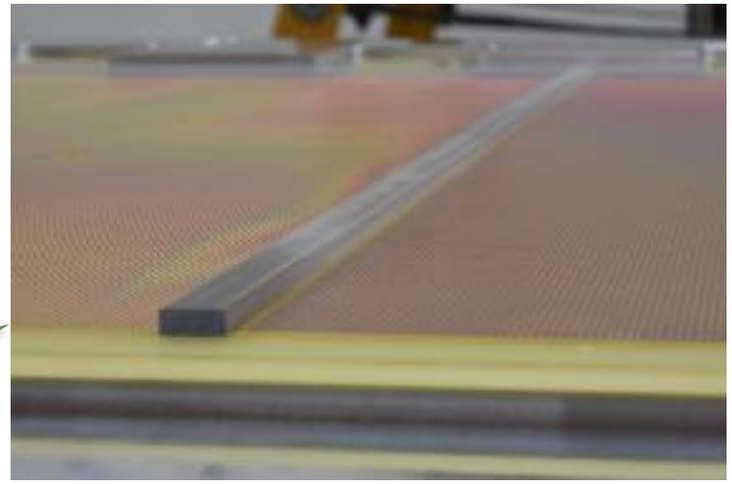


- Silicate glass resistive plate (~10^{10} Ωcm)
- Resistive plate coupled to anode through graphite-epoxy layer (~ MΩ)

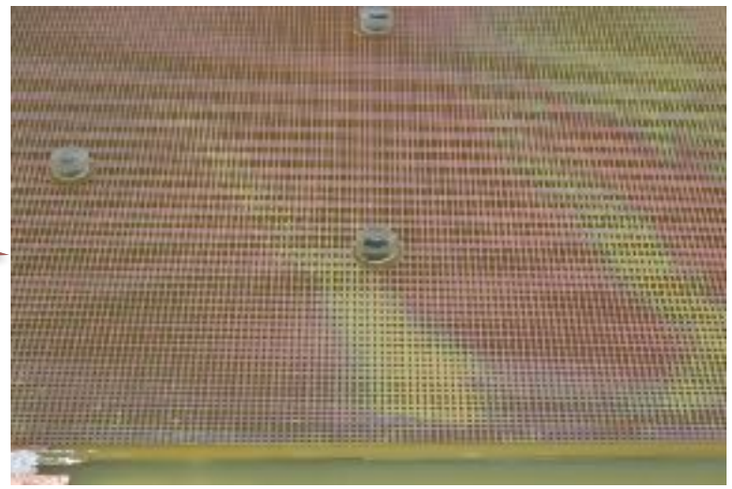
First model (July 2017)

2 THGEM segments

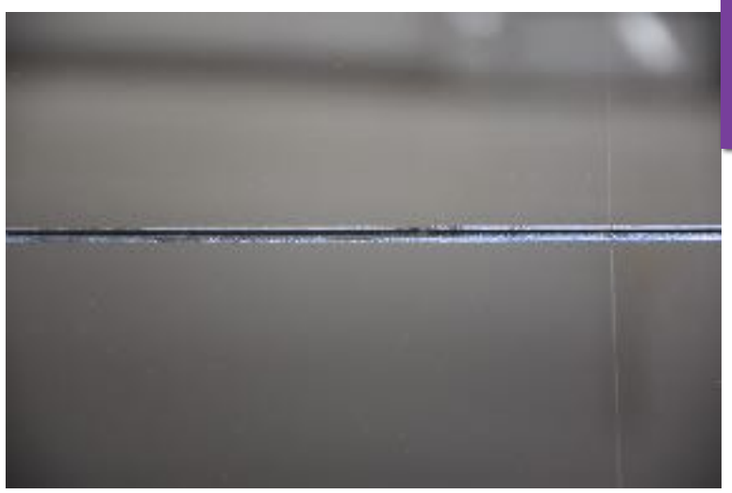




central spoke



spacers



protected glass interfaces

July 2017: Results

✓Scan area with muons

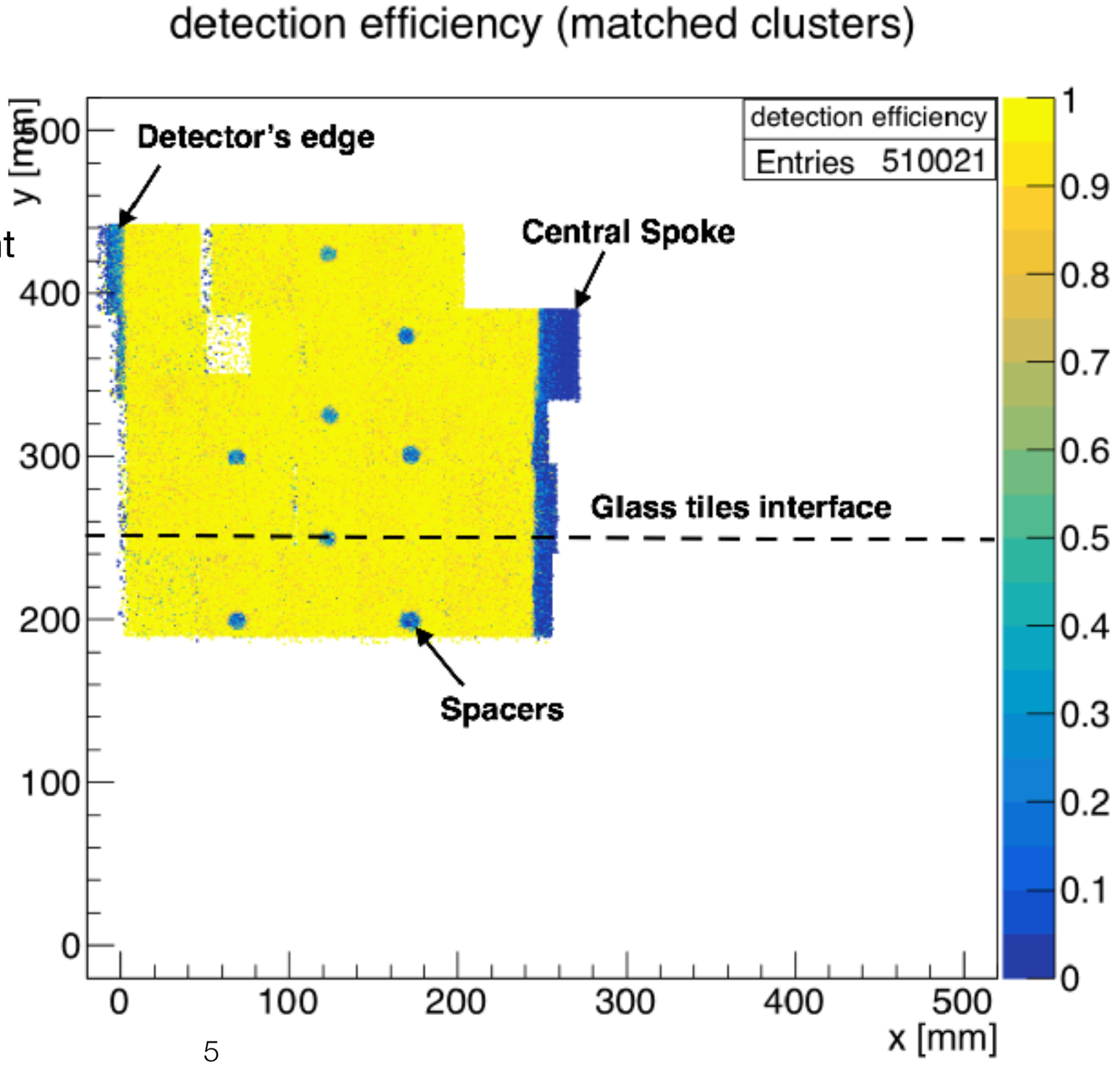
✓Detection uniformity ~20%
• Also in the interface of two adjacent glass tiles.

✓Detection efficiency >95%

✓Electrical stability

Next step (April 2018):
- Minimize dead area

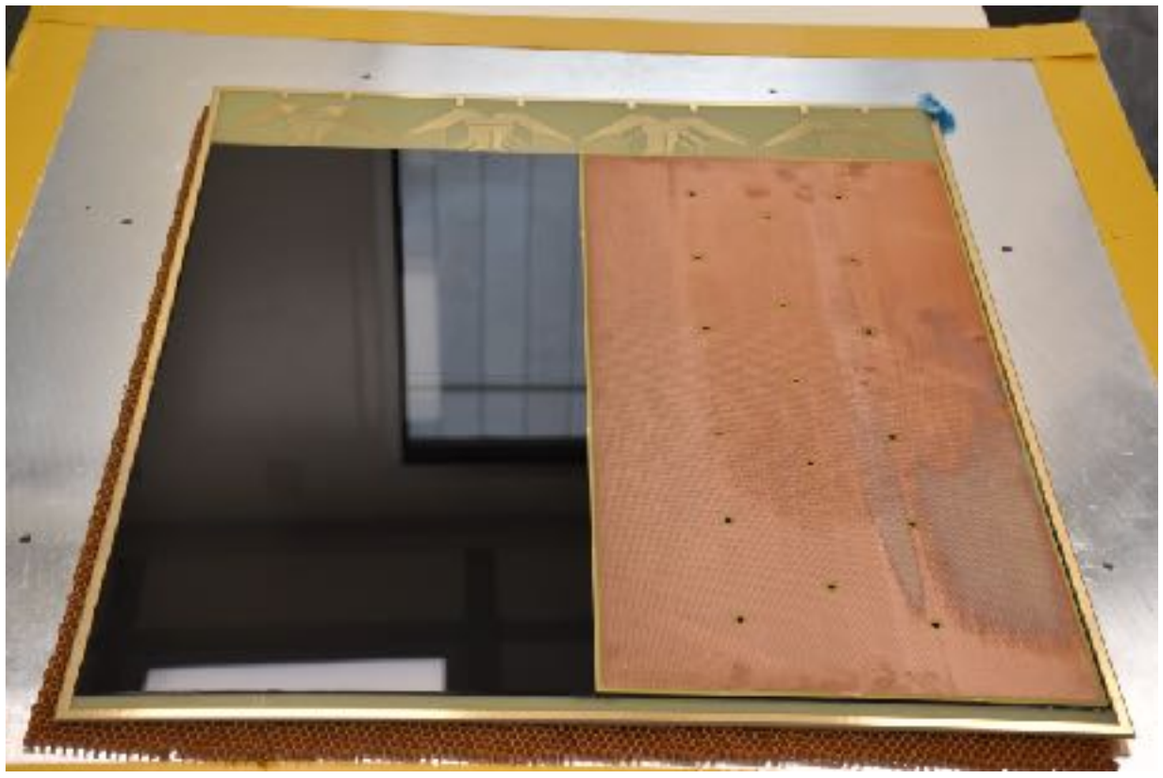
In particular - avoid dead areas in the central region (to be compatible with (S)DHCAL prototype)



New prototype (April 2018)

- Spoke and spacers were removed

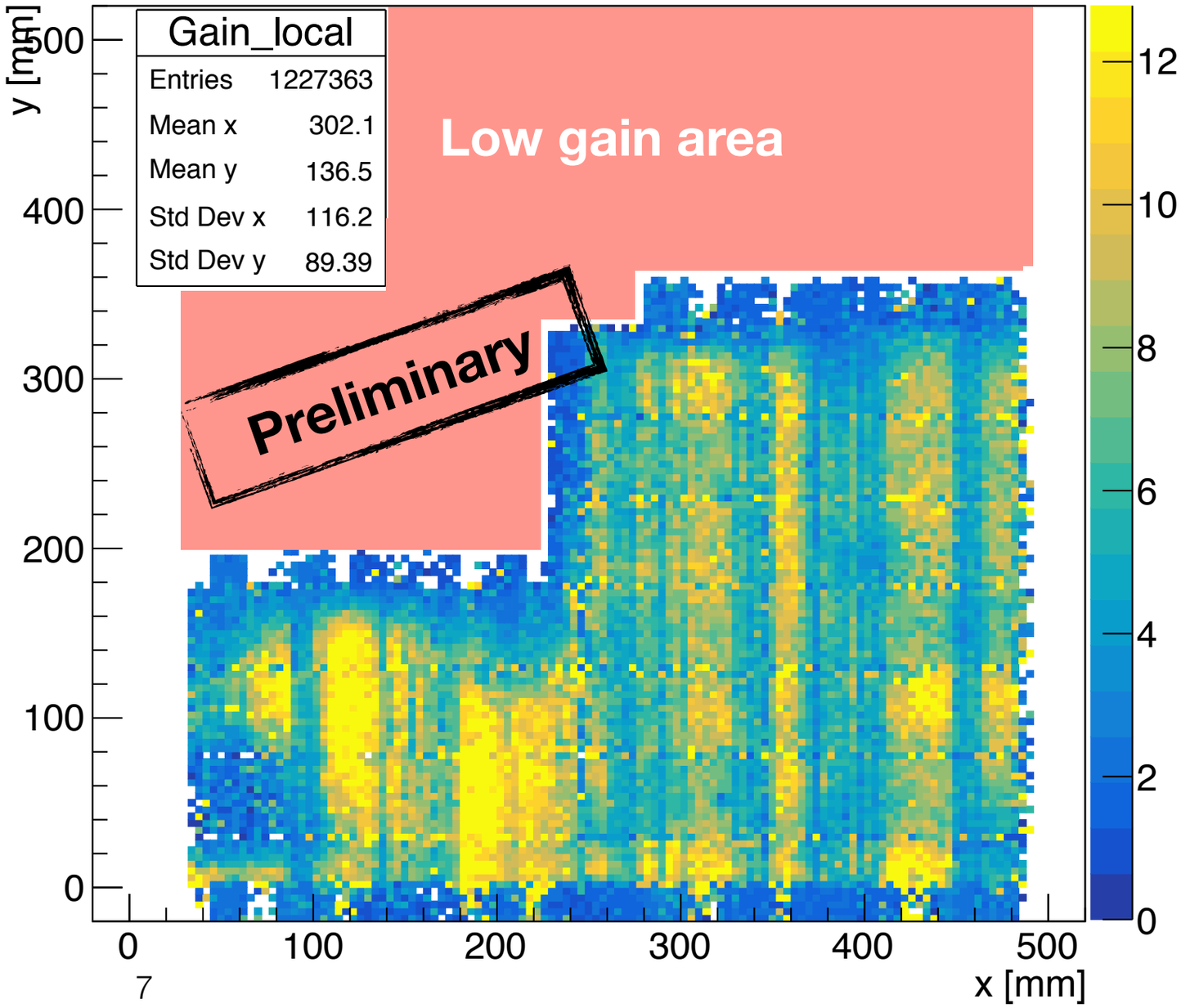
- Electrode was glued to the anode



April 2018: Results

- The gluing concept was working
- But, improvement is needed as part of the electrode was pealed off
  - ~50% of the area with low gain
  - Testing different glues
- Non-uniform is under investigation

cluster charge (matched clusters)



Near Future plans

- Optimize the gluing procedure
- Obtain new 50x50 cm2 electrodes
  - Maximal active area (no dead area for spacers)
- Test beam (August 2018)
  - 50X50 cm^2 RPWELL coupled to MICROROC
  - 50X50 cm^2 RPWELL coupled to strips

Thank you