EPR update

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GEM database EPR

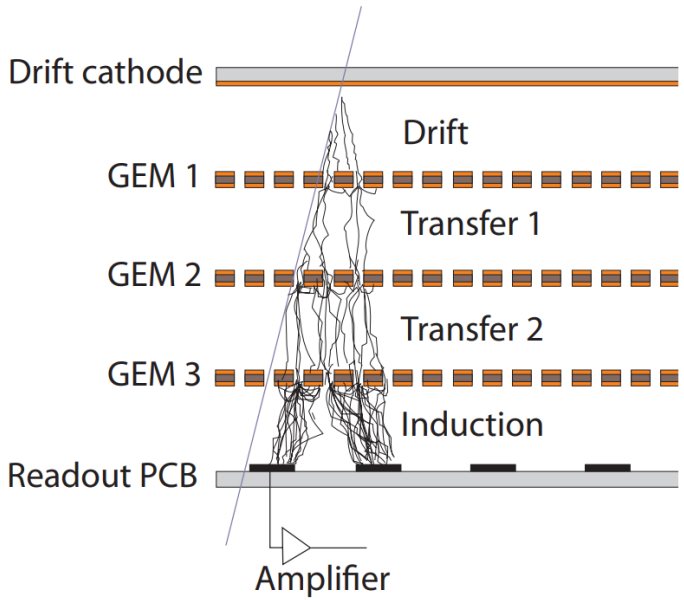
- QC records in XML for GEM ME0 components: **external frame**, **internal frame**, **foil**, **readout board** and **drift board** to be uploaded to the gem database.
- Gem database (access authorization needed): https://cmsgemdb.web.cern.ch/cmsgemdb/prod/first.php
- QC from PDF and excel format reports, and foil QC from CMS elogs.
- Uploading using **dbloard-gem** session (access authorization needed) on the lxplus.

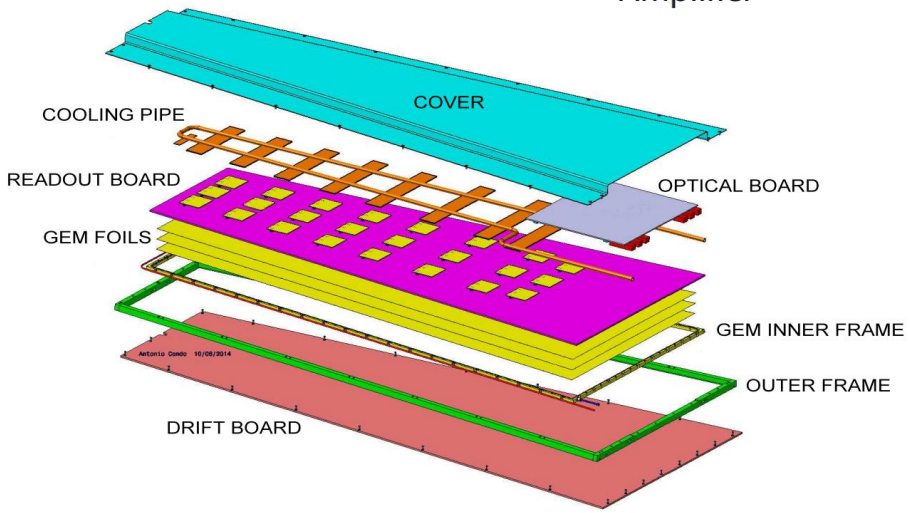
GEM database upload status

- All components gotten has been registrated
- QC uploading status:
  - External frame: uploading done, need to clear run number with Stefano
  - Internal frame: uploading done, need to clear run number with Stefano
  - Drift board: B04 uploading fail, cannot fix with changing run numbers, other uploaded, need to clear run number with Stefano
  - Readout board: uploading done, need to clear run number with Stefano
  - Foil: B07 and B08 uploading fail, other uploaded
- The main reason for the failure is duplicated records on the database. This is a bit strange as there should not be the same records in the database before my submission. I will check this together with Stefano.

```
org.hibernate.NonUniqueResultException: query did not return a unique result: 8
```

GEM structure and components





- Plot from the GEM TDR (not ME0, but similar)
- Foils are with two-side insulated small holes for amplifying the signals when passing through.
- External frames hold and seal (with O-rings) the foils.
- Inner frames for spacing the foils.
- Drift board induce electrons and readout read in 8 VFATs with multiple stripes.

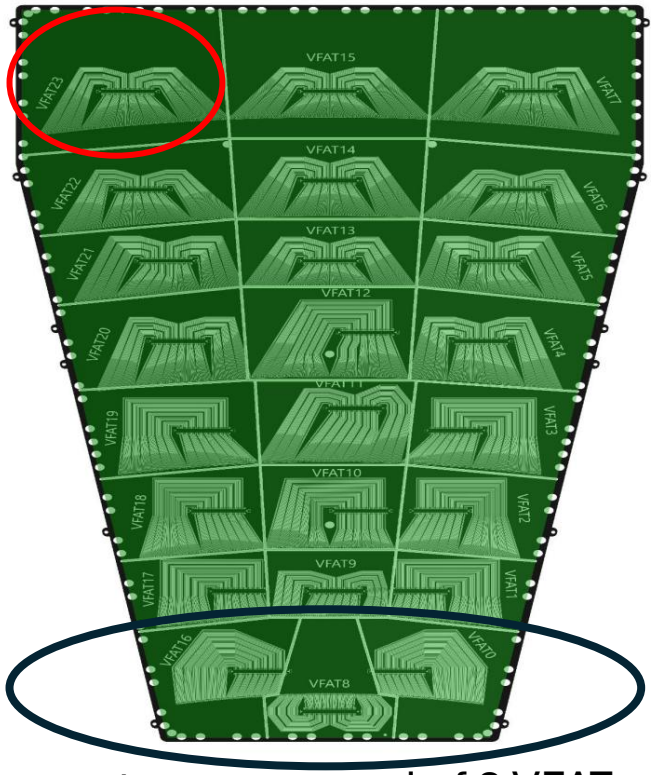
QC terms

- External frame: the surface quality (coating, surface and corner flatness and damage), width and depth.
- Internal frame: thickness and geometrical shape.
- PCBs: thickness and shortage in circuit.
- Foils: voltage responds, requires limited leakage in high voltage test.

AutoDQM development

- Further checking the VFAT-wise and eta-wise measurement. Readout board layout from ME0 QC report (using GE11 in this task, but similar)

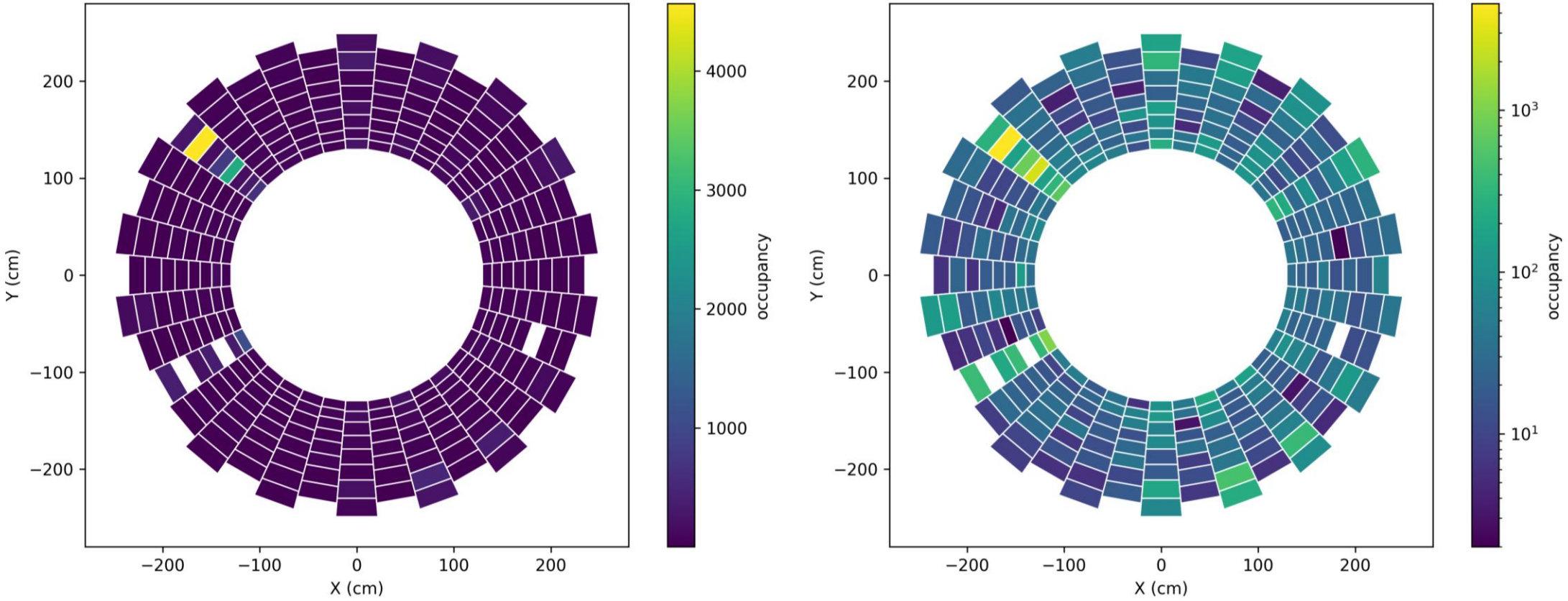
A VFAT



A eta-sector, composed of 3 VFATs.

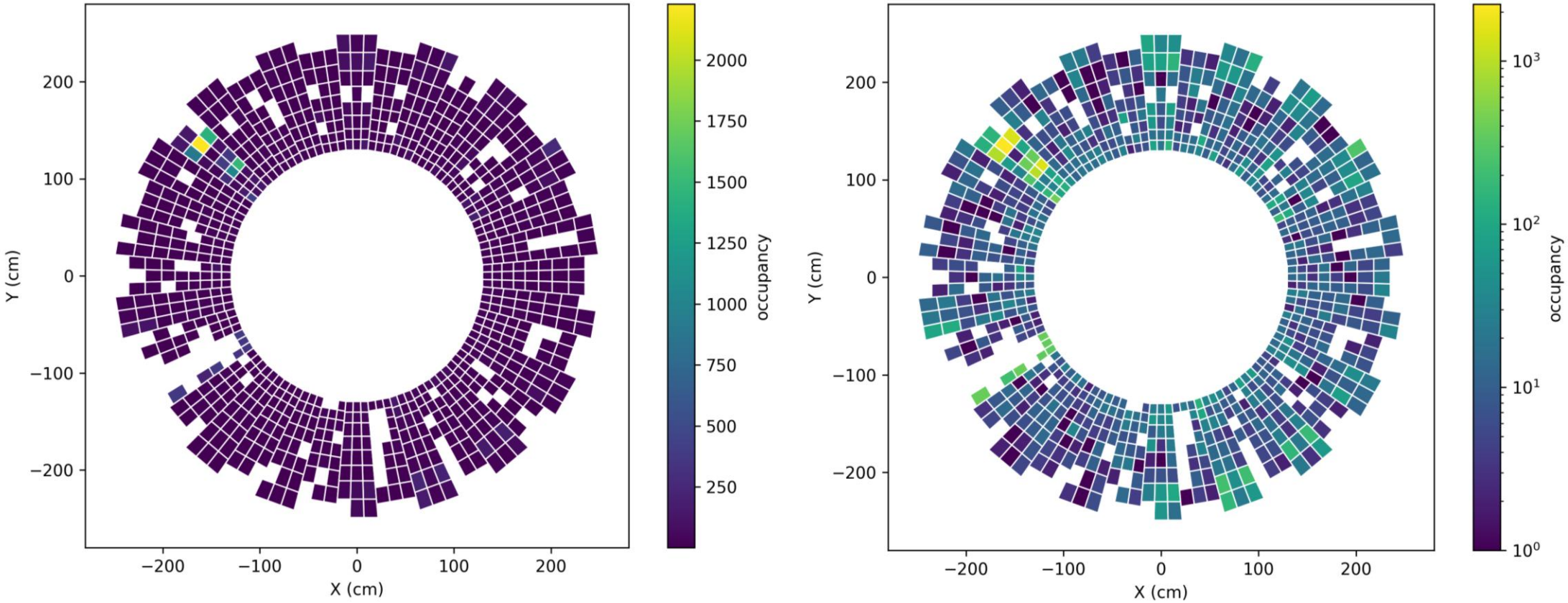
- Readout board geometry:
  - 36 chambers of two types, each cover $10.15°$ (with overlapping).
  - The adjacent chambers are of short and long types alternately, starting from +x direction, aligned counterclockwisely.
  - Short chamber starting from 130.2cm away from the beamline, with eta (roughly) length: 10, 10, 12, 12, 14 ,14, 17, 17 cm.
  - Long chamber also from 130.2cm with eta length: 11, 11, 14, 14, 16, 16, 19, 19 cm.

Eta-wise occupancy plots



- Linear and log scale hit in each eta-sector for GE11 layer 1 middle chambers illustration.
- Plot from the ME of Run 386478, lumi section 2.
- Most of the eta-sector has small occupancy, thus a log-scale plot will be more clear.

VFAT-wise occupancy plots



- Linear and log scale hit in each VFAT for GE11 layer 1 middle chambers illustration.
- Plot from the ME of Run 386478, lumi section 2.
- I would expect this shall be a suitable starting points for the training. Keep in communication with Marco.